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# BURSITIDES OF THE PLANTAR SURFACE OF THE FOOT

## (PAINFUL HEEL, GONORRHEAL EXOSTOSIS OF THE OS CALCIS, METATARSAL NEURALGIA)

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OF the multitudinous painful affections of the feet the bursitides have received but little attention. In fact, save those beneath the tendo achillis, they have been all but wholly ignored. Some orthopedists recognize painful heel as being in rare instances due to an inflammation of the bursa over the greater tuberosity of the os calcis. The bursae about the sustentacular region have been wholly ignored, my own contribution being the only one in the literature. The bursae in the anterior part of the foot have been wholly ignored. Under the name of Morton's disease painful affections of the anterior part of the foot have an extensive literature. It is my purpose to discuss the bursae of these three regions in their practical aspects.

*Calcaneal Bursitis* (Painful Heel. Stone Bruise). A number of separate conditions must be discussed under this head. In clinical reports commonly no attempt is made to localize the point of greatest pain. A pain anywhere on the plantar surface is so included. The term "stone bruise" has been applied by English authors.

Painful heels may be divided into those in which the chief point of pain is in the posterior part of the heel and those in which the greatest pain is in the anterior part. It is necessary first to consider the anatomical facts.

*The Posterior Calcaneal Bursa.* That pain in the chief bearing surface of the heel may be due to a bursitis in this region is mentioned by several authors, notably Whitman,[17] Duplay[2] and Epstein.[4] In the dissecting room it is the most easily identified of all the bursae of the foot.

This bursa is situated over the tuberosity of the os calcis. It is 1½ cm. or more in diameter, lying on the periosteum but may extend to the beginning of the aponeurosis of the flexor brevis muscle (*c*, Fig. 1; *b*, Fig. 2; and *a*, Fig. 3). It is situated at the point where the chief weight comes in the standing position. As may be well seen in *a*, Fig. 3 the bursa covers most of the area of the lower surface of the os calcis. The bone is bare of tissue save for the periosteum. The wall of the bursa, aside from that formed by periosteum, is formed by a thin layer of connective tissue lined by endothelium.

Just anterior to this bursa, and over the aponeurosis of the short flexor, is an inconstant, smaller bursa (*b*, Fig. 3). It is situated at a right angle to the bursa above described. If this inconstant bursa need have a name it may be called *the mid-calcaneal bursa.*

*The Anterior Calcaneal Bursa.* Not until Baer brought exostosis of the os calcis into causal relationship was there any definite, concentrated effort to clarify the nature of "painful heel."

On the basis of 6 cases, Baer[1] concluded that painful heel is due to an exostosis of the tubercle of the os calcis the result of a gonorrheal infection. It is worthy of note that one of these patients denied having had gonorrhea and, aside from having a painful heel there is no evidence adduced that he had the disease. In only three of the patients operated on was there a biscuit-shaped coccus demonstrated in the tissues. The only one of these in which a culture was obtained was the patient

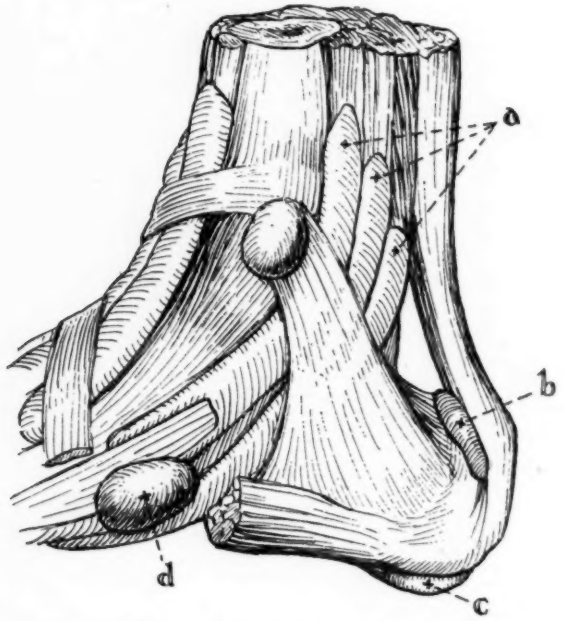


Fig. 1. Bursae about the heel, lateral view. *a*, Bursae about the tendons of the tibialis posticus, flexor digitorum longus and the flexor longus pollicus. *b*, Bursa of the tendo achillis. *c*, Posterior calcaneal bursa. *d*, Anterior calcaneal bursa.

in whom gonorrhea was not proven. This then, is the basis on which the theory rests. Few bacteriologists would accept as proven the identity of an organism on so little evidence. No other more definite evidence has been published and most of those investigators who have attempted to verify the evidence had not succeeded even in finding a biscuit-shaped organism. It is of interest to follow the evidence available in the literature. Ebbinghaus[3] assumes without argument that the exostoses were of gonorrheal origin. Holtzapfel[7] likewise assumes the gonorrheal origin of the spurs. If the patient has had gonorrhea the diagnosis is as good as made, he asserts; but he says not a word as to the basis of this assertion. In this country Epstein[4] reports 14 cases which he assumes to be of gonorrheal nature though he admits cultures were negative, "due," he says, "to the short life of the gonococcus." Since the cocci survived in Baer's cases we must conclude from the evidence at hand that the New York gonococcus is of shorter life than those of

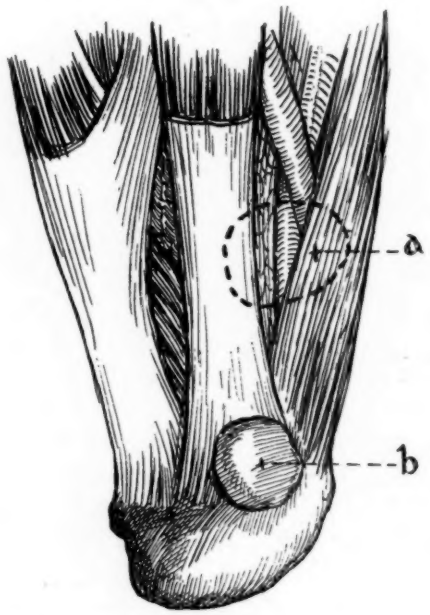


Fig. 2. Bursae about the heel, inferior view. *a*, Anterior calcaneal bursa. *b*, Posterior calcaneal bursa. This bursa should cover the greater portion of the bone.

Baltimore, which is contrary to what one would have expected. These citations, which might be multiplied many times, will serve to show on how slight a foundation rests the assumption of the gonococcal origin of the spurs. It need not be mentioned that nowhere else in the body do exostoses occur about known gonorrheal infections. The burden of proof certainly rests on those who assume the gonococcal origin of the spurs.

Furthermore it is worthy of note that in 2.87% of adult males these exostoses are found. They are more common in those of middle or advanced years and in those who have done strenuous physical

labor. Exostoses are often found in muscle or fascial insertions in other regions, particularly about the knee or shoulder.

Insofar as clinical reports are specific the points of maximum pain are placed over the tuberosity of the os calcis or the anterior part of the os calcis or, as Holzapfel states, "located exactly on the processus medialis tuberis calcanei." This, it will be noted, is beneath the middle of the sustentaculum tali. This is the point of attachment of the adductor hallucis

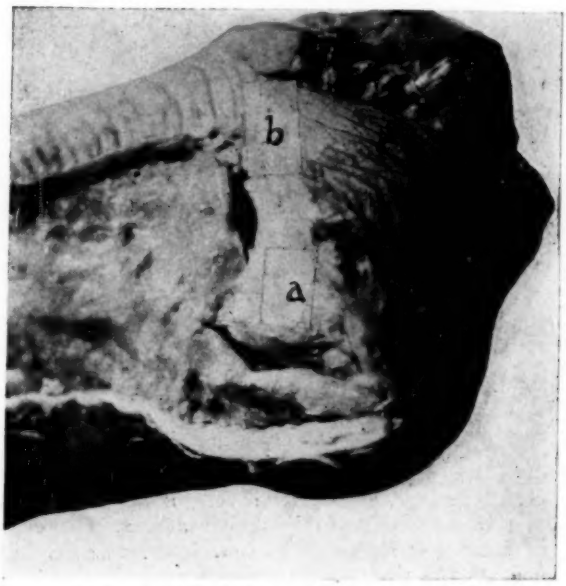


Fig. 3. Bursae of heel, lateral view, recent dissection. *a*, Posterior calcaneal bursa. This bursa covers the entire inferior surface of the calcaneal tuberosities. *b*, Mid-calcaneal bursa lying over the aponeurosis.

brevis and the flexor brevis digitorum and the plantar fascia. Beneath the sustentaculum glide the flexor hallucis pollicis, and the flexor longus digitorum tendons —quite a busy corner, so to speak. It would seem that these various structures should receive a careful scrutiny in the search for the cause of pain particularly when the pain is increased when these structures are brought into action.

I have described a bursa lying between the muscles and tendons above-named.[7] That the destruction of these bursae cures the patient strongly suggests a causal relationship. This probability is increased in those cases in which cure is so obtained without molesting the exostosis. This is even more emphasized in those cases in which the exostosis was removed with failure to cure and the patient was subsequently cured by the obliteration of the bursa. Then, too, in very few of my patients was there reason to suspect a gonorrheal infection.

The exact location of this bursa is over the flexor tendons that pass under the sustentaculum and beneath the short

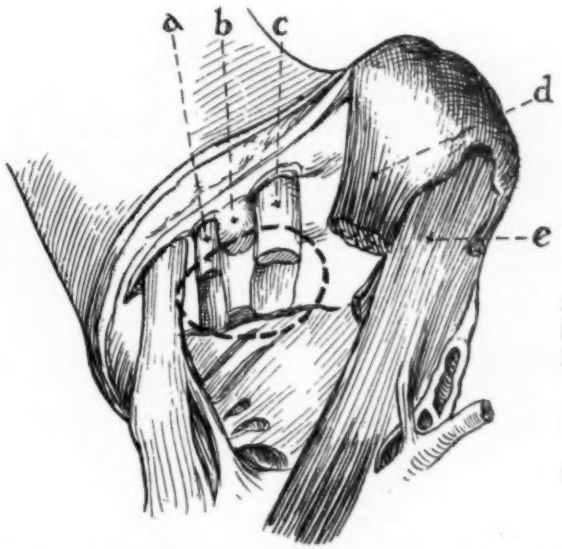


Fig. 4. Lateral view of the heel showing the general relations. *a*, Flexor brevis digitorum. *b*, Tubercle of the astragalus. *c*, Flexor longus digitorum. *d*, Origin of the abductor pollicis. *e*, Aponeurosis of the short flexor muscles.

flexors (*d*, Fig. 1). In figures 2 and 4 it is represented by the dotted circle as lying over the tendons above mentioned and just lateral to the tendon of the tibialis posticus. It lies just anterior to the posterior tubercle of the astragalus (*b*, Fig. 4). Viewed from below it is seen to lie below the short flexors reaching to near the midline of the foot (*a*, Fig. 2). In the recent dissections the exact relation of this bursa to the several tendons is variable. In figure 5 it is seen to lie directly over the flexor longus pollicis and is separated from the flexor longus digitorum by a layer of fatty tissue. It may lie over the flexor longus digitorum but usually

lies equally over both. In rare cases it lies over the tibialis posticus just beneath the medial border of the adductor hallucis. This is its most superficial location. When the origin of the abductor hallucis is severed it is seen to lie beneath this muscle and to extend beneath the origin of the short flexor (*c*, Fig. 6). It is well shown in the fresh dissection photographed in figure 7 in which a 38 special bullet lies within the bursa. The adductor muscle has been removed. The tibialis posticus tendon lies above. The nose of the bullet lies just below the sustentaculum.

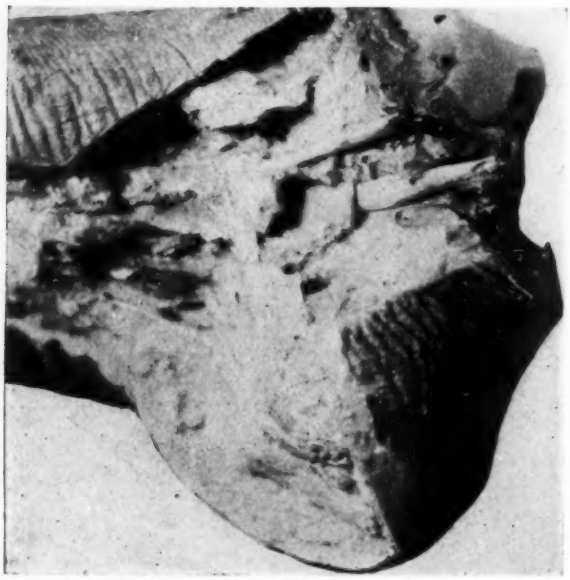

Fig. 5. Bursae of the heel, lateral view, recent dissection. *a*, Anterior calcaneal bursa. Above it is the flexor longus digitorum, beneath it the flexor longus pollicus. *b*, The site of the mid-calcaneal bursa. The bursa has been removed in exposing the anterior bursa. *c*, The posterior calcaneal bursa, which shows imperfectly because of the collapse of its walls.

*Symptomatology*. It is necessary to keep clearly in mind the difference between an acute and a chronic bursitis. In the acute stage there may be evidence of swelling and increase of temperature in the region of the affected area but due to the deep location and the rigidity of the structures covering the bursae under discussion this is seldom observed. One of the most important symptoms in the acute form is explained by Steill as a sudden change in the circulation. The pain is most severe the moment the heel strikes the ground, less painful while in contact with the ground and more severe again the moment the foot is lifted. It is my judgment that the intensity of the pain is accounted for by the movements of the walls of the bursae against each other on increasing and decreasing the pressure, rather than by variation in the blood supply as Steill believes. It is like strapping a pleuritic chest during the time the body weight holds the inflamed surfaces in contact.

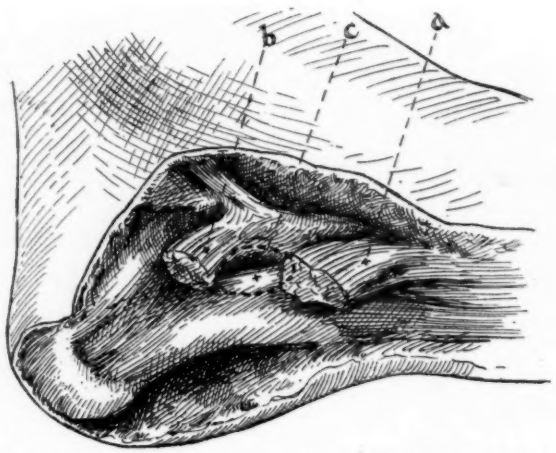


Fig. 6. Drawing from a dissection of the anterior calcaneal bursa. *a*, *b*, Ends of the severed abductor hallucis muscle. *c*, The bursa lying beneath. *x*, The edge of the flexor brevis digitorum. The bursa extends beneath this muscle.

The confusing factor is the diffuse distribution of the pain. It may be most intense over the middle plantar region or even on the dorsum. The ankle may be the site of the chief complaint. Dorsal flexion of the foot may increase the pain markedly particularly when the anterior bursae are involved. The pain may be referred to the calf or even up the thigh leading sometimes to the diagnosis of sciatica. The pain may be so severe that the patient seemingly makes no effort to aid the surgeon in locating its chief point. These are the extreme cases. In the lesser degrees, and in the more severe ones after the height of the inflammation has been passed, if the foot is placed comfortably at rest and the surgeon carefully explores the heel with the tip of one finger, at first

gently then gradually exerting more pressure, the point of maximum tenderness can be found. If the point of maximum tenderness is found to be over the anterior bursae dorsal flexion may increase the pains. When this is present it is a sign of confirmative value.

In the chronic cases careful palpation usually reveals the site of greatest deep tenderness. Often the patient has already determined the site. Not infrequently a spur will have been removed which is

Fig. 7. Recent dissection showing the location of the bursa just beneath the tibialis posticus.

evidence that some one has concluded that the site of the pain is at the anterior part of the heel. It must not be forgotten that when there is tenderness over both extremities of the heel both bursae may be involved. A failure to remember this obvious fact has made it necessary for me to operate a second time in several instances.

*Treatment.* It is necessary again to remember the difference between the acute and chronic forms. In the acute type complete rest is necessary with some sort of fixation. The use for a day of the old-fashioned lead water and opium greatly expedites recovery. A rest of ten days may allow the process to recover just as in the case of bursitis in other situations.

When the subacute or chronic stage is reached operation should be resorted to without delay. The use of pads and other doo-dads recommended by most orthopedists is an unwarranted waste of time.

The line of incision had best be made along the medial border of the heel. The incision depicted by Moorhead[12] for removing the spurs is excellent for reaching both bursae. For reaching only one it is unnecessarily long. For the posterior bursa one-inch incision just over the medial tuberosity allows the bone to be reached by the curette most easily (*a*, Figs. 8 and 9). Usually a bursa half an inch or more across

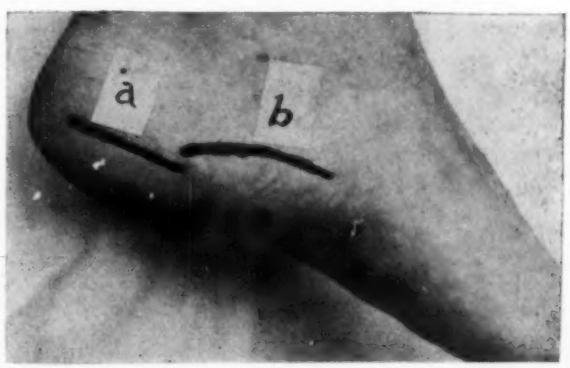


Fig. 8. Ink tracing indicating line of incision for reaching the calcaneal bursae. *a*, Posterior bursa. *b*, Anterior bursa.

is easily demonstrated. Vigorous curettage with a mastoid curette is all that is needed. The periosteal wall should be completely removed. The wound may be packed with a strip of gauze soaked in 3% tincture of iodine for a day. This sets up a reaction calculated to make obliteration more certain, and it prevents the collection of serum.

The anterior bursae are not so easily demonstrated at operation. An incision along the medial border of the foot just beneath the sustentaculum is the most convenient (*b*, Figs. 8 and 9). The incision is continued with the handle of the knife superficial to the tendons and beneath the origin of the abductor pollicis. The surgeon need not expect to fall into an obvious pocket in this region, as is common with the posterior bursa, but only areas in which the dissecting instrument meets a lessened resistance. The site of inflammation may be not only in the bursa herein

illustrated but may involve the tendon sheaths as well. It is necessary to find all involved areas with the curette. Fortunately, so long as the tendons are not injured it is not possible to curette too vigorously. A gauze pack is placed in the

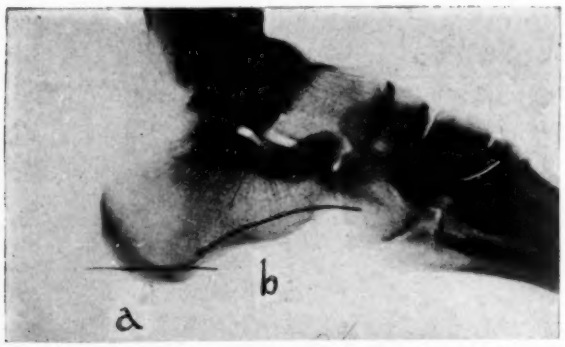


Fig. 9. Preceding lines projected on the bone by means of the *x*-ray.

curetted area, as above described, and the wound is closed about it. The pack is removed the following day. The patient leaves the hospital in a week and in two weeks can walk about and tell other sufferers the joyous news. My earlier cases have remained well now more than

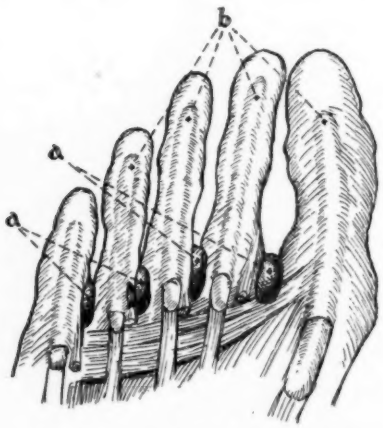


Fig. 10. *a*, The metatarso-phalangeal bursae. *b*, The sheaths of the flexors of the toes.

twenty years. If one attacks the wrong bursa it is necessary to seek the offending one at a subsequent operation.

*Anterior Plantar Bursitis* (Metatarsal Neuralgia. Morton's Disease). Painful affections of the anterior part of the foot have amassed an interesting literature. Briefly summarized it is as follows: In 1876 Morton[14] described a painful affection of the anterior arch. He ascribed it to a neuralgia. This hypothesis was advanced apparently on negative grounds. Subsequent writers have followed Mortons'

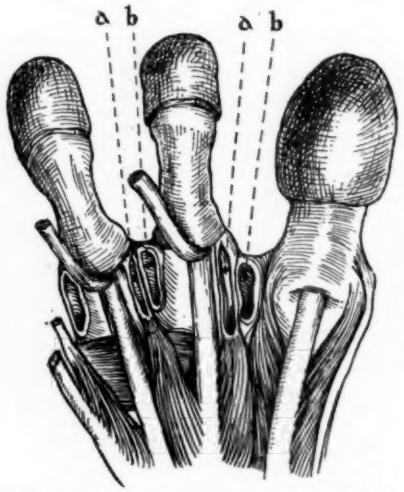


Fig. 11. Bursae about the toes. *a*, Lumbrical bursa. *b*, Metatarsophalangeal bursae.

conclusions without question. Nothing ever was advanced to prove the assumption. Resection of the head of the bone

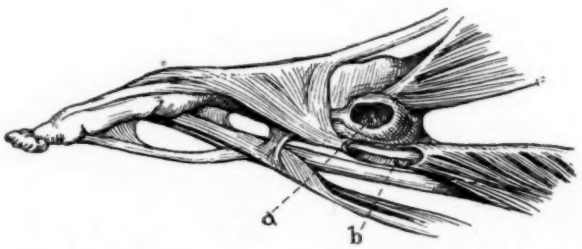


Fig. 12. Bursae about the toes. *a*, Metatarso-phalangeal bursa. *b*, Lumbrical bursa.

brought about a cure. Jones and Tubby are particularly enthusiastic about this treatment. Mention is made by some authors of the distribution of the pains to various parts of the foot, even to the calf, but it was not suggested that this was evidence of the neuralgic nature of the disease. The more frequent occurrence of the pain about the fourth metatarsal head was ascribed to the fact that the fifth metatarsal bone being shorter allowed its head to impinge on the nerve. The removal

of the head of the bone is supposed to relieve this impingement.

So far as my reading has led me no one has suggested that in the removal of the metatarsal head the bursae lying beside it also were removed, nor that the removal of the bursae alone might effect a cure. So far as I know, gonorrhea has never been suggested as an etiological factor, possibly because these patients are usually matrons of maturer years and most surgeons are persons possessed of a certain amount of discretion.

Anatomical considerations are first in order. There are many bursae about the metatarso-phalangeal articulations. Two only will be mentioned here, the metatarso-phalangeal and the lumbrical. Those situated about the tendons of the dorsum and those about the special tendons of the great and small toe may be disregarded. By far the most important are the metatarso-phalangeal bursae (Figs. 10 and 12). These lie, as the name indicates, between the metatarso-phalangeal joints of adjacent toes. They are easily demonstrated anatomically as pockets nearly a centimeter in diameter. They do not connect either with the joints or with the adjacent tendons.

*The Lumbrical Bursae.* These bursae surround the tendons of the lumbrical muscles (*a*, Fig. 11 and *b*, Fig. 12). They are easily demonstrable anatomically but their involvement is difficult to demonstrate clinically. When slight passive movements of the toes cause pain destruction of these bursae should be sought at operation.

*Symptomatology.* Here again the acute and chronic must be separated. Here, more often than in affections of the heel, there is swelling and obvious increase in the heat of the part. The pain is apt to be referred to other parts of the foot. The entire area is sensitive to pressure and to passive manipulation. Often there is a history of injury.

In the chronic form there is complaint of pain when the foot is used in walking, particularly after prolonged use. Most often the outer part about the fourth toe is complained of. The local findings may be slight, out of proportion to the complaints of the patient. Usually manipulations calculated to cause one metatarso-phalangeal joint to move against its fellow elicit pain, this giving the surgeon information as to the area chiefly involved. I have injected a local anesthetic into the suspected area. If the pain is temporarily relieved it eliminates the likelihood of the involvement of other bursae.

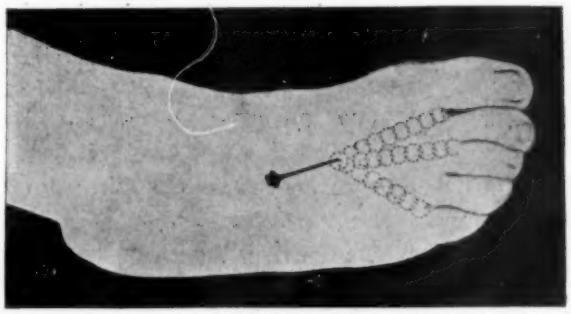

Fig. 13. Incision for obliteration of the bursae of the anterior arch. The lines show the direction of the skin infiltration. Deeper infiltrations are made through those lines.

*Treatment.* In this situation the acute cases can be managed by non-operative treatment—temporary use of the lead acetate pack with subsequent adhesive plaster immobilization. A small pad is placed in the hollow of the arch and the toes are held firmly together by an adhesive strip. It is easy in this way to immobilize the parts producing the friction. Even in long standing cases this procedure often produced a lasting cure.

In the chronic cases the bursae should be obliterated with a curette. The skin is anesthetized over the metatarsal joint involved or in a line on either side if two incisions are to be made (Fig. 13). Two incisions make the operation easier. After the skin has been infiltrated the deeper structures are anesthetized. The bursae are freely curetted. A small pack, as above described, should be inserted for a day. If the lumbrical bursae are suspected the area proximal to the joint and the area

lying more deeply should be curetted. One might say the head of the metatarsal bone may be separated from the surrounding tissues as if one intended to resect it and then do not do it. Of course the joint is not opened and it is not necessary to separate the soft parts so completely. The foot is put at rest for a week by a tight circular bandage and then the patient may be allowed to go about.

## DISCUSSION

The first question at issue is, in the light of this experience what does the exostosis have to do with the clinical picture? I have cured the patient by obliterating the bursa after the removals of exostoses have failed to do so. Also I have cured the patient by obliterating the bursa and allowing the exostosis to remain unmolested. The conclusion is that the exostosis is an innocent bystander. Some operators have explained the failure to cure by assuming that the exostosis recurred. No evidence has been offered. Why then does the removal of the spur sometimes cure the patient? It is interesting to note that when the removal of the spur is effected through the incision that transverses the site of a bursa cure is accomplished. Obviously in reaching the spur the bursa is inadvertently obliterated. For example, Moorhead shows in the illustration of his operation for the removal of the spur that not only the anterior bursa but the posterior as well was opened while approaching the spur. Operators who go down on the spur through a small plantar incision usually fail to cure their patient.

The second question is the nature of the disturbance in painful affections of the anterior part of the foot. That there is a flattening of the anterior arch (Goldthwait[6]) in some cases may be admitted but it most certainly is absent in many. The reason that binding the foot relieves pain is not that it restores the arch but that it prevents movements about the inflamed bursa. Rest, preventing friction, is the ideal treatment for any bursitis and in recent cases results in a cure. By strapping the foot this rest is secured, again just as strapping the chest in pleurisy secures rest. This is true in any part of the body as well as in the foot. Cure of the so-called metatarsal neuralgia has been secured by resecting the head of the metatarsal bone, by the injection of 10% to 30% carbolic acid mixtures (Lange[10]), osmic acid solution and other destructive agents. These measures are none the less effective in obliterating a bursa because they were directed at a nerve. Our therapeutic endeavors are often more nearly correct than our reasoning. Finally, when the bursae are obliterated the patient recovers and stays well and we need have no concern whether the arch is flat or not.

I have no desire to engage in a discussion with orthopedists as to the causes of pain in flat-foot. My experience in management of the painful affections of the anterior arch causes me to question some of the more generally accepted views of the causes of pain in flat-foot. One can conceive that in the process of formation of the deformity the pain may be due to undue tension on ligaments, but once the foot is down persistent pain should be sought in some of the multitudinous bursae in the painful region. That the pain is due to the stretching of the ligaments is purely parlor philosophy. No one has ever proven anything. It is repeatedly stated that the ligaments are very sensitive. Anyone who works with local anesthesia knows that they are not sensitive. Like the peritoneum, they become sensitive only after they become inflamed. The stretching of the non-inflamed peritoneum is not a painful process, as every fat man knows. At any rate, it is not the deformity itself but the result of it that causes the pain. One might as well say that flat-foot is the cause of snoring. The observant traveler, by noting the shape of the shoes under the sleeping car berths can predict from whence the loud snoring will come during the night.

The flat feet and the snoring are both the result of excess weight.

The bursae are at least tangible things. They can be demonstrated anatomically and it is known that inflamed bursae hurt. There is no speculation about these facts. If by obliterating these bursae we relieve the pain we have gone a long way toward proving a point.

In considering the pains in flat-foot a number of bursae besides those above discussed need be kept in mind. One would think for instance of inflammation of the bursa about the flexor hallucis brevis, that between the adductor hallucis and the tendon of the tibialis posticus, situated just anterior to the one I have described. The bursa about the point of insertion of the tibialis posticus is constant and must be remembered. Besides, it must be remembered that in any area where constant pressure occurs a bursa may form. This fact is especially pertinent in consideration of painful points in flat-foot.

In the various operations for flat-foot, such as Ogston's, bursae are destroyed and this may have been the reason pain was relieved. For instance, on the lateral side are the bursa between the tendon of the peroneus longus and the abductor of the little toe and that between the short flexor of the little toe and the base of the corresponding little toe. Finally there must be considered the synovial sheaths about the tendons, particularly those that pass below either malleolus (Merrill[13]). Orr[15] recognized the seat of the difficulty in a patient and divided the peroneal tendon. A resection of the sheath I venture to say would have accomplished the same result. Merrill noted tenderness at the insertion of the posterior tibial muscle and over the tarsal ligament; bursal involvement was not considered.

The operation for the obliteration of any bursa is such a simple matter that, when pain can be localized by palpation in the region of a bursa, I believe we are justified in performing an operation. Painful affection of the feet are an anatomic problem and must be solved, knife in hand, in the laboratory and in the clinic.

## CONCLUSIONS

1. The association of gonorrhea with exostoses and painful affection of the feet has not been proven.

2. The association of pain in the feet with stretching of ligaments rests on the assumption of sensitiveness of ligaments. This conclusion was arrived at by a process of exclusion and is contrary to the facts.

3. Certain painful affections of the feet occur in regions where bursae are known to exist.

4. The clinical manifestations are similar to those of bursal inflammations in other parts of the body.

5. Obliteration of these bursae by operation cures the patient.

6. Operations based on other hypotheses (*e.g.*, exostosis) do not cure the patient unless the bursae are inadvertently oblitèrated.

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# VISCEROPTOSIS

## A PLEA FOR SURGICAL TREATMENT

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VISCEROPTOSIS has possibly occurred during all ages of human existence, or, as Darwin has said, "since man ceased to walk on all fours and assumed the erect posture." It is estimated that 75 per cent of females and 5 per cent of males suffer more or less from this disorder. Ptosis may be congenital or acquired.

The congenital type is seen in that class of individuals with broad shoulders, wide hips and narrow waist line, most likely the descendants of tuberculous parents. In such individuals the stomach may be found in the pelvis with downward excursion of both kidneys or, in fact, of all the abdominal viscera, and yet they may be in relatively good health, and no doubt many enjoy a reasonably comfortable physical existence, and are never conscious of being the subjects of ptosis.

The acquired type represents a different set of conditions. These are the individuals who suffer most, because the ptosis often follows some protracted illness, such as typhoid fever, pneumonia, or other acute disease that has been prolonged by complications. Particularly is this true where there has been extreme emaciation and great relaxation of the abdominal muscles, as well as absorption of fat from the lesser omentum and the gastrohepatic and gastrocolonic ligaments, which permits them to stretch and become much elongated. Acquired visceroptosis also occurs after the removal of large abdominal tumors, the evacuation of great quantities of ascitic fluid, and rapidly successive pregnancies and childbirths.

In 1835 Glénard published his thesis on this subject, since which time visceroptosis has been called "Glénard's disease." In that memorable thesis, besides describing the conditions found, the etiology, pathology and symptomatology, he made the statement that these subjects were unfortunate in that there was no treatment that had ever been devised which had done them any good and that, in his opinion, they were consigned to a life of invalidism.

It seems remarkable that for nearly one hundred years the medical profession has taken it for granted that Glénard knew what he was talking about. There have been a few who held contrary views, such as S. Weir Mitchell, who more than a quarter of a century ago discovered, that nearly all of his neurasthenic and neurasthenoid patients, were the victims of visceroptosis. By keeping these patients recumbent with the foot of the bed elevated ten to twelve inches and confining them thus for one to two years, with rapid feeding of easily assimilated diet, paying special attention to the giving of such foods as would cause them to acquire fat and weight, he found that nearly all recovered from their diseased mental states; and he correctly concluded that their mental obliquity was the result of their visceroptosis, or at least the result of conditions that followed the ptosis.

In later years many physicians have attempted to treat their ptosis patients in that way and with more or less success, the measure of success depending upon proper control with reference to confinement in bed and nourishment. However, there are few people who are willing to remain in bed for one to two years, especially so long as they are able to get around and eke out a miserable existence—and some are not financially able to do so.

When I began the practice of medicine and surgery it occurred to me there should be some means of relief, when such a large percentage of people were the subjects

of ptosis. It was distressing to see so many individuals thus afflicted and to be able to do nothing for them. These unfortunates enlisted my sympathy and I spent many hours of thought and study in attempting to devise some means for their relief.

In 1900 I operated upon a female almost in extremis from starvation the result of a pyloric neoplasm that had the appearance of being malignant. Her condition was such that a partial gastrectomy could not be safely performed, and the only thing we could do for her was the classical posterior gastroenterostomy, which was quickly accomplished. On account of the enormous gastric dilatation I was doubtful whether this would be of any service for gastric drainage and, while holding the transverse colon out of the abdominal cavity at the completion of the operation, it occurred to me that the stomach and elongated transverse colon could be maintained in proper position by colonic implantation. This was successfully done, the colon being fastened to the anterior abdominal wall in a position nearly anatomically correct. The patient made a splendid recovery and subsequent roentgen-ray examination showed that she was relieved permanently of her gastrocoloptosis. At the time of operation she weighed 82 pounds. She improved rapidly, and within a year weighed 130 pounds. The body weight has not only been maintained, but two years ago she weighed 168 pounds and was still physically able to enjoy life. Parenthetically it may be said that the supposed malignant neoplasm must have been benign in character. Insofar as the ptosis was concerned, the result obtained in this case led me to perform a similar operation several times for the purpose of correcting gastrocoloptosis, and with a few exceptions the patients have regained their normal weight and are perfectly well.

A few years later I was gratified to hear Coffey, of Portland, Oregon, read a paper on the so-called "hammock operation" which now bears his name, and was much impressed with his classification of visceroptosis and the patients he believed could be benefited by the hammock procedure.

Since that time I have known of many physicians who attempted the Coffey operation as I understand it (*i.e.*, shortening the gastrohepatic ligament by plication and suturing the omentum, where it leaves the transverse colon, to the anterior abdominal wall, thereby forming what is known as the hammock in which the stomach may permanently rest in an elevated and more normal position) and later condemn the procedure because of failure to secure the desired results.

If the operation be correctly performed, I cannot understand how there can be more than one chance of failure, and that would be in cases where the suture material was faulty, either in tensile strength, or absorbability. I have had two cases of that kind in my practice. In each failure was due to the fact that the suture material used did not hold long enough,—and sutures of the same material also failed in other operative work to hold as long as I wanted them to. These sutures were absorbed within three or four days instead of lasting ten or more days.

Certain surgeons have maintained, and possibly correctly so in some instances, that sutures placed in the omentum would tear through, and failure would be inevitable. However, if I remember correctly Coffey not only advocated lifting the omentum and placing the sutures through it, but also called special attention to the fact that the white (fibrous) band formed by the fibers of the omentum, as they pass around the intestine, should be included in the sutures. At least that has been my practice, and with the exceptions already mentioned, I do not recall having had a single failure in keeping the transverse colon properly attached to the anterior abdominal wall.

Nearly all ptosis patients undergo all sorts of examinations and treatments by

general practitioners, and have lost in weight and physical vigor until life has become a burden, and their sufferings have become so great that they apply to the surgeon with the hope that something may be done to make their existence worth while.

Before entering further into the subject I desire to say that a large number of ptosis patients have come under my observation and surgical treatment who, once invalids, are now stout and well and capable of enjoying life. Surgeons are making a mistake who condemn the efforts of others in this line of work, because if only a small percentage of these patients were relieved by operative measures, it would certainly be worth while to give them the benefit of the doubt and a chance to get well, instead of closing the doors of hope and consigning these unfortunates to perpetual invalidism.

For those who think these patients cannot be relieved by surgery, I venture the statement that I can show them dozens of individuals in Louisville and surrounding territory who have been made entirely well.

There are many individuals with visceroptosis who are perfectly well, and it would be a crime to even tell them that they have a "fallen stomach" or that other viscera have gone on a downward excursion. There are others, however, where there may be little enteroptosis, where the alimentary tract is giving very little distress, but where the patient may have pain in one or both kidney regions, on account of dragging on the postparietal peritoneum by displaced kidneys, more particularly the right. Not infrequently such patients have been operated upon for supposed appendicitis, and their symptoms continued until unilateral or bilateral nephropexy was performed. In not all the congenital cases does the individual escape severe symptoms of visceroptosis, because I have seen quite a number where operation became necessary to afford relief.

Then again, I am quite sure, there are cases of ptosis that have followed falls alighting in an upright position, even in individuals of relatively normal weight and health, and in such cases we may find not only one or both kidneys displaced, but even a general visceroptosis. I have among my records two such instances. However, it is quite certain nephroptosis and other abdominal ptoses due to traumatism must be very rare.

While it would be difficult to determine whether a gastric or colonic dilatation caused ptosis, or the ptosis was responsible for the dilatation, I can understand how in gastric and duodenal ulcerations with stenosis ptosis might be produced, as there is nearly always more or less gastric dilatation. Moreover, I am reasonably certain that I have seen ptosis following such lesion. Again, in constriction of the colon at the splenic and hepatic flexures due to angulations or ulceration, colonic dilatation may result. I can appreciate how the heavy colon making traction on the other abdominal viscera might bring about ptosis.

The abdominal viscera are held in place by folds of the peritoneum, and at certain points like the gastrocolonic and gastrohepatic ligaments not only is the fibrous tissue somewhat modified in its appearance from the general peritoneum, but it is very materially modified by the deposition of fat. This is also very noticeable throughout the mesenteric folds. Therefore when ptosis follows starvation or disease, where there is general absorption of adipose tissue throughout the body, if tension on the ligaments is removed, and if by feeding the patient may be made to accumulate fat generally distributed, as has been found by S. Weir Mitchell and others, not only may the ptosis be cured but the individual may be relieved of all symptoms incident thereto.

*Symptomatology*. In nearly all cases of visceroptosis more or less emaciation has followed, the degree depending upon the length of time the ptosis has existed.

The skin has a peculiar leathery appearance, and in some cases there is marked relaxation depending largely upon the degree of emaciation. When operating it is noticeable that suturing the skin is not unlike the suturing of leather.

There is more or less dragging pain at the hepatic and splenic flexures of the colon which are fixed points. Where there is nephroptosis the pain radiates downward almost to the pelvic brim, depending upon the descent of the kidney (or kidneys), which makes traction on the postparietal peritoneum. There is always more or less constipation due to intestinal angulations, especially at the colonic flexures, also flatulency and borborygmus.

The digestive function is disturbed due largely to gastrointestinal stasis. As may well be appreciated, if the patient is carrying the stomach in the pelvis, so long as the erect posture is maintained the onward excursion of the gastric contents is almost impossible. In most of such cases the patient suffers from hyperchlorhydria, gaseous eructations, etc., and sometimes vomiting of food that has remained in the stomach for many hours with more or less discomfort from so-called "dyspepsia."

On account of general weakness the patient tires easily, and fatigue is hastened by prolonged physical exertion.

*Pathology.* There are no very marked pathological changes incident to visceroptosis except as concerns its consequences, such as extreme emaciation, etc. Gastric ulceration might be induced by prolonged retention of food in the stomach which would necessarily undergo fermentation. It may also be appreciated that because of angulations, duodenal ulcers might be common, and on account of the general intestinal stasis, intestinal ulcerations might be superinduced.

I have seen appendicitis that was most likely the result of angulation and torsion due to downward excursion of the right kidney. In nephroptosis nephritis and pyonephrosis may be due to ureteral angulations.

*Diagnosis.* Since the roentgen ray has come into general use, there is no occasion for a mistake in the diagnosis of visceroptosis. From the symptomatology and the roentgen-ray findings with the patient in various positions, the diagnosis can be easily made.

The patient should have free catharsis the evening before the examination is to made, with no supper, and a light breakfast followed by a low enema. The barium meal is given about noontime, after which the roentgen ray will reveal the position of the stomach, and by watching at regular hourly intervals the fluoroscope will show the location of the test meal in its onward excursion.

On many occasions it has been observed that the stomach will remain in the pelvis when the patient is placed in the recumbent posture. It has also been noted that if there are no adhesions when the recumbent position is assumed the stomach will gravitate to its normal place. Thus it may be easily appreciated why patients who have had ptosis long enough to acquire experience always eat a light breakfast and luncheon, and a larger evening meal, because the ingestion of a large amount of food when he is to remain in the erect position will within a few hours produce very distressing symptoms. Many of these patients understand that if they recline after eating a heavy meal digestion takes place normally and there is no interference with the onward progress of the gastrointestinal contents; but because of pyloric or duodenal torsion, which always occurs with a full stomach, if he remains in the erect position there will be much distress after a heavy meal. We have demonstrated time and again that barium will remain in the stomach until the patient assumes the recumbent posture.

In cases where the stomach, transverse colon and the greater omentum are adherent in the pelvic region, the recumbent position does not facilitate digestion and drainage. These patients have an erratic appetite, sometimes they have anorexia

for several days and can hardly be induced to eat anything; then follows a period when they are ravenously hungry and proceed to gormandize, and are distressed from pain and the resulting intestinal toxemia. Nearly all of them suffer more or less from headache, migraine and neuralgia; a large percentage of them become neurasthenic or at least suffer from neurasthenoid states.

Coincidental with gastroptosis the patient may have other abdominal trouble especially in the appendix or the pelvic viscera.

*Treatment.* The therapeusis of visceroptosis may be divided into, (a) medical, and (b) surgical. It is now almost a universally recognized fact, as evidenced by the grouping of physicians who follow various special lines of work, that with such combinations far better results can be secured for their patients than when any one specialist tries to handle all the work. There is now hardly a human ailment, and especially is this true of chronic disorders such as visceroptosis, in which better results cannot be obtained by the internist and surgeon working hand in hand, sharing equally the responsibility in the care of the patient.

It has already been stated that some cases of visceroptosis are curable by medical management alone. I can well understand that where there are no visceral adhesions if the patient be kept in the recumbent posture and properly fed to insure a marked gain in weight and accumulation of fat, possibly within one or two years he may be entirely cured. It has been my observation, however, that it is almost impossible to control patients or keep them in bed long enough to secure very much benefit from the "rest cure." Many people are unwilling to undergo such treatment so long as they are able to be about, and others are not financially able to undertake it. Of course, we all appreciate the great usefulness of rest and appropriate treatment for ten or fifteen days preparatory to surgical intervention. I am quite sure there is no argument that the internist is needed in cases of visceroptosis, especially where renal changes such as nephritis, pyonephrosis, etc., have occurred, because with proper position and medication these conditions can be alleviated and the ptosis materially benefited if not entirely relieved.

What text-book authors have to say about the therapeusis of visceroptosis impresses any broad-minded physician as quite extraordinary. The uninitiated and unsophisticated would naturally conclude that there exists but one method of treatment, and that should be conducted by the internist. I am glad to note that surgeons, as a rule, are big enough to include every specialist, whatever his field may be, to assist them in their surgical work; and, I am personally acquainted with a large number of excellent general practitioners of medicine who are perfectly willing to help surgeons in the treatment of their ptosis patients.

It may be stated that in all cases of visceroptosis where adhesions maintain the organs in an abnormal position, the treatment is primarily and essentially surgical. Also in cases where quick results are desired, and patients are unwilling to admit to a prolonged period of treatment, surgery is advisable.

These patients are hospitalized, general routine examinations are made, and every means are utilized to get them in as good physical condition as possible before operation. The operative procedure consists in replacing and fastening surgically the ptosed viscera in as nearly normal position as can be maintained. Normally the stomach is situated under the left breast just beneath the diaphragm with the pyloric extremity about at the median line.

The statement "as nearly normal position as can be maintained," is made advisedly, because in any patient whose stomach has for months or years been low in the abdominal cavity, accompanying

general ptosis of the abdominal viscera, if an attempt is made to replace the stomach and maintain it in the normal position, the patient will likely remain well for only a short time, *i.e.*, until he begins to gain flesh. A peculiar condition seems to occur, probably due to an impression made upon the pneumogastric nerve by which inhibition is lost, and the patient becomes the subject of tachycardia. Under such circumstances it is my opinion that if the new attachments are not quickly released and the viscera freed, sooner or later the patient will suddenly succumb. Unfortunately I have had four such cases ranging in point of time from four weeks to one year after operation.

I had one patient whose normal weight was 124 pounds. At the time of operation she weighed, fully dressed, just 64 pounds and had been in bed one year. The ptosis was so marked that, in my anxiety to be certain of adequate correction, I am sure the organs were attached too high; but she did relatively well until her weight increased to 124 pounds when she suddenly developed tachycardia and dyspnea. She had regained her normal weight and the ligaments were composed of adipose tissue (which was the normal support anyway) and I advised her to allow me to release the attachments made at the former operation. She agreed and secondary operation was accordingly performed. Any doubting Thomas who could have seen this case would have been convinced. The transverse colon was firmly attached to the abdominal wall in its entirety and separation to allow it to regain its freedom was quite a difficult task. The patient has since gained 14 pounds, now weighing 138 pounds, and has had no recurrence of the tachycardia since the day of her last operation.

In a general way it may be said there are several things that might be done surgically to complete the operation for visceroptosis. My plan has been, in ordinary cases without adhesions, to anchor both kidneys if they are displaced. It will be remembered that the kidneys are normally maintained in position by fat, the great blood vessels and ureters, and when the fat is absorbed the kidneys are allowed a greater range of motion than normal which causes tension upon the blood vessels and ureters. In ordinary nephroptosis the kidneys are easily replaced and maintained in position by No. 2 sutures introduced through the lower pole of the kidney and its capsule, then through the solid muscles of the posterior abdominal wall. This can be satisfactorily accomplished through the abdominal incision made to correct the gastroptosis. It is wise to examine the appendix and to remove if pathological.

In ptosis patients it is not uncommon to find that the bile ducts have been twisted by the downward motion of the duodenum, and not infrequently there will be noted coexisting cholecystitis and possibly cholelithiasis. Should these be present, the calculi should be removed and tube drainage instituted through a stab wound at the regular point for gallbladder drainage. The drainage tube extends through and is anchored to the abdominal wall.

If the gastro-hepatic ligament is very much elongated, plication should be instituted. The transverse colon is implanted in the anterior abdominal wall, extending from about the eleventh rib on the left to one inch below the twelfth rib on the right side. This is easily accomplished by five sutures, one at each end, one in the middle, and one on either side between the end and the middle sutures. In doing this the middle suture fastens the colon to the abdominal wall slightly beneath the umbilicus. From experience I have found that by thus placing the sutures I have had no complications and no sudden deaths.

*Prognosis.* Of more than one hundred patients operated upon for visceroptosis, so far as I know all are living, except the

four already referred to, none of whom died immediately following operation or while in the hospital.

There were two failures due to faulty suture material in that it was absorbed within three or four days and before union could occur. Both of these patients have been operated upon secondarily and are now well. All the others have improved in health, some have gained very materially in flesh, and all now weigh about what they should for their height.

# FIBROCYSTIC DISEASE OF THE LONG BONES

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[From the Hospital for Joint Diseases]

OUR present day knowledge of the diseases of bone represents the product of research of about the last fifty years. Prior thereto the literature contained a mass of confused case reports with little or no attempt at pathologic grouping.

These fifty years date from approximately 1873, when Adolph Kölliker propounded his osteoblastic and osteoclastic theory of bone production and bone absorption. This period was marked by intensive histological studies of bone disease and is characterized by such names as Bassini, Paget, Ziegler and, later, von Recklinghausen. This period yielded detailed pathologic descriptions by the master minds of medicine, that stand today as classic.

With the introduction of the Roentgen ray, the second period dawned. So overwhelming in amount and intimate in detail have been the revelations of the *x*-ray, that scientific channels have been fairly glutted with the wealth of undigested material.

Insufficient time has as yet transpired to enable us to arrange and correlate this newly acquired knowledge and as a result, much confusion still reigns in our interpretation and grouping of the facts at hand.

The term fibrocystic as applied to diseases of the long bones is descriptive of a complex pathological process. The term is useful inasmuch as it provides a first step in diagnostic analysis or grouping of bone disease. The group of fibrocystic diseases comprises a number of closely related conditions, all of which present a more or less similar pathological picture.

The etiology of these conditions remains still entirely obscure, sometimes suggesting chronic infection, but more often a disturbance of bone metabolism from dysfunction of some central mechanism.

This central mechanism is still entirely unknown, and whether it is controlled by vascular, nervous or pluriglandular influences is entirely speculative and not within the realm of this paper. There is, however, strongly suggestive evidence that these changes in bone are similar to the connective tissue changes that occur in the kidney, liver and spinal cord, which in the older nomenclature was called chronic productive inflammation.

For various reasons, the characteristic changes in this group of diseases do not permit of a single description. Bone at one period of life will respond to the invasion of disease differently than at another period. Cancellous bone reacts differently than does lamellar bone, and vascular and nutritive variations produce their respective differences in the resultant pathology.

These lesions may be diffuse, involving all of the long bones, mandibles and skull, or may be solitary or localized.

Histologic and roentgenographic differences will necessarily appear between lesions occurring in the mandibles with their alveolar structure, the long bones with their lamellar structure, and the bones of the skull with their diploic structure.

There is at present no pathognomonic histologic picture of any of the diseases of this group, but common to the entire group are lesions of rarefying and proliferative ostitis with decalcification and absorption, subperiosteal new bone formation and osteoid tissue of myelogenous origin with evidences of calcification, and replacement of medullary substance in varying degrees by areas of vascular connective tissue and cartilage.

This complex histological picture can perhaps be summed up as stated by Ham-

burger and Nachlas, "as a chronic inflammation peculiar to osseous tissue."

I have taken the point of view in discussing osteogenic sarcoma that neoplastic invasion involves the soft tissue stroma of bone, and that the osteogenic structure is a reactionary product and, biologically speaking, not really a part of the neoplastic process (*Archives of Surgery*, April, 1926, Vol. 12, No. 4).

Fig. 1. A. M. Ostitis fibrosa cystica. Right femur, showing thinning out of the cortex and fibrous replacement of the medulla. The site of an old healed fracture can be seen.

I feel very strongly that, in our interpretation of diseases in bone, if we will visualize the disease as a process primarily of the soft structure, that is, of the soft structure comprising compact and cancellous bone, and the calcific changes as secondary thereto, we will be on our way to reconcile many of the manifestations we find in bone that have been hitherto difficult to understand. The fibrocystic diseases, I believe, will find an intelligible explanation on this basis.

Before proceeding with a discussion of the pathological states of bone, it is well to obtain a clear conception of what bone really is, and to leave far behind us the thought that the bone cell is a fixed mass of inert inorganic matter.

In speaking of the bone cell, I make no reference to the lacunar cell, upon which careful studies have been made by T. H. Bast (*Anat. Rec.*, Vol. 28, No. 1, June 25,

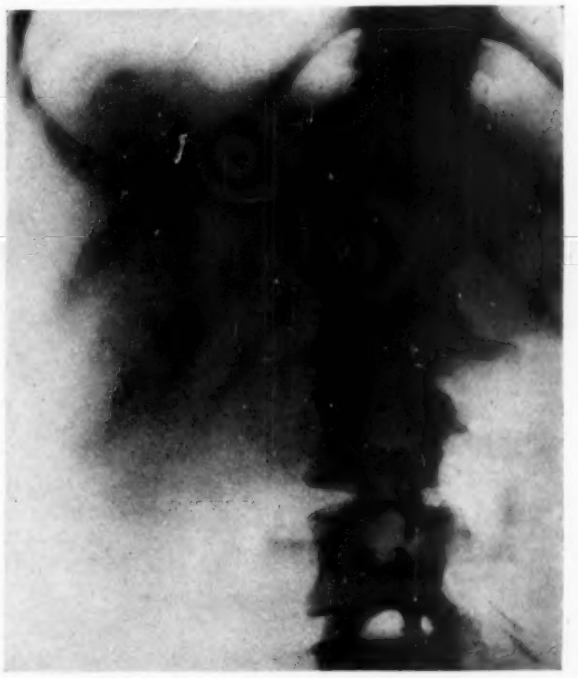

Fig. 2. A. M. Ostitis fibrosa cystica showing involvement of ribs.

1924; *Amer. Jour. Anat.*, Vol. 29, No. 2, July 15, 1921; *Amer. Jour. Anat.*, Vol. 29, No. 3, September 15, 1921) and others, but of the material spoken of as the calcified matrix of bone, which upon decalcification leaves a fibrous cellular stroma.

It is this finished product of bone structure that is of interest to the surgeon, and it is here that one must seek a solution for those baffling pathological processes, presented especially in fibrocystic disease.

My conception of the calcified matrix is that it consists of active living cells, in which the protoplasm holds its calcium content, probably in a colloid state, in a

highly labile condition, readily susceptible to chemical and biological influences.

I would visualize the cell of the calcified matrix as consisting of an irregularly shaped cell wall containing a nucleus like that of the fat cell, flattened against the cell wall, the protoplasm of which is a calcific reversible colloid (James C. Watt, *Biol. Bull.*, Vol. 44, No. 6, June 1923).

With this conception, it is quite conceivable that biological processes may occur that alter the protoplasm of the matrix cell in such manner that it can no longer hold fixed its calcium content, the liberation of calcium varying in amounts in different conditions, reaching a degree of complete decalcification. The decalcified cell returning to, or approaching its mesenchymatous state might then take over any of the functions or forms of the mesenchymatous connective tissue cell, and in fact apparently it does. In ostitis fibrosa cystica, for instance, young healthy connective tissue with clearly stained nuclei may be seen, or large or small areas of healthy cartilage; or a reversion to embryonic tissue may be seen in myxomatous changes, or such areas may have been converted into bone cysts containing clear fluid.

Fig. 3. A. M. Photomicrograph of section of rib. Ostitis fibrosa cystica of right femur and ribs.

This conception, it seems to me, would immediately reconcile the confused pathology of this group of diseases, and would go far towards a better interpretation of the conditions presented in many other bone lesions.

Without digressing too far from my subject, I would like to refer to the instance of osteomyelitis, as applied to this conception of the bone cell. In osteomyelitis there is death of the bone cell, that is, death of the protoplasmic or vital constitutent of the bone cell, in contradistinction to the process in fibrocystic disease. There follows, in consequence, an inhibition of biological influences upon the calcific colloid, resulting in a mass of dead, inert, calcific material, destined to become sequestrum, and dependent upon molecular disintegration for its separation.

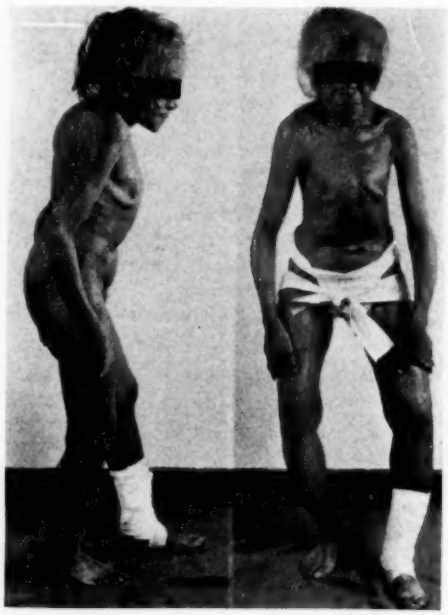

Fig. 4. I. F. Showing general gorilla-like posture of Paget's disease with head sunk upon thorax, protruding sternum, abdominal sulcus, etc.

A recent clinical experience lends corroboration, at least in some measure, to this point of view.

The patient, a female of 19 years, was admitted to the Hospital for Joint Diseases for disability of the right hip. The roentgenogram showed an old lesion of the hip and ostitis fibrosa cystica of the

upper half of the right femur (Fig. 1). A roentgenogram of the chest revealed a similar process in several ribs. On account of the distribution of the lesions, the possibility of multiple myeloma was entertained although the Bence-Jones reaction was negative.

In order to verify the diagnosis of ostitis fibrosa, a section of one of the involved ribs was removed and the wound closed.

Fig. 5. I. F. Skull.

(Figs. 2 and 3.) Five days thereafter the wound was found to be suppurating and was therefore opened and drained. As a result of this infection, we anticipated a protracted convalescence, with osteomyelitis of the ends of the rib and perhaps secondary resections. To our surprise, no osteomyelitis occurred, the infection disappeared and in ten days the wound was entirely healed. The healing was in all respects exactly as would have occurred in cellular connective tissues.

If a deduction can be drawn from this one observation, it appears to be, that decalcified living bone cells, react to infection in the same manner as does connective tissue, and as a corollary to this deduction, that in osteomyelitis, the presence of the devitalized calcium mass is a deterrent to the healing process.

The manifold factors entering into the production of the fibrocystic diseases account sufficiently for their variety and for the vanishing borderline between them.

The conditions that I would include in this group are:

Osteomalacia
Ostitis deformans (Paget's disease)
Ostitis fibrosa cystica { generalized / localized

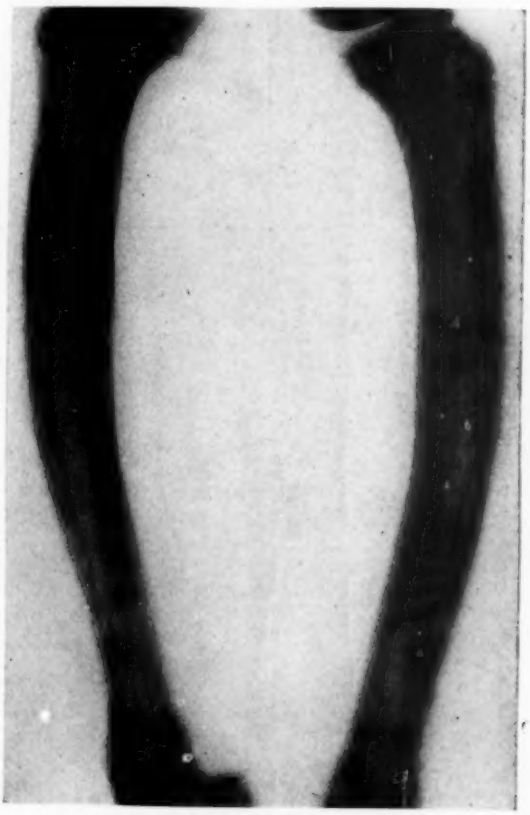

Fig. 6. I. F. Ostitis deformans of tibiae.

Leontiasis ossea
Bone cysts (certain types)
Chondromata (certain types)

It is not my intention to describe in detail any one of these conditions, but rather to attempt to show the relationship between the diseases of this group that more frequently come under our purview.

Geoffrey Jefferson (*Brit. Med. Jour.*, Vol. ii, 1915, pp. 219–233) reported a case of typical ostitis deformans in which the zygomatic process on one side was very much enlarged, and commented upon the

similarity between ostitis deformans and leontiasis ossea. D. W. Parry (A case of ostitis deformans, *Brit. Med. Jour.*, 1912) Bernard Meyers (*Lancet*, 1914, Vol. 1, p. 176) likewise report cases of ostitis deformans in which the lower jaw was much enlarged. More recently L. P. Hamburger and I. W. Nachlas (Leontiasis ossea as a manifestation of Paget's disease, *Arch. Surg.*, March, 1926, Vol. 12, p. 727) report

Fig. 7. I. F. Ostitis deformans of bones of upper extremities.

a case of leontiasis ossea of twenty-eight years duration showing the characteristic roentgenological changes of Paget's disease. They say, "It is a curious fact" that it is not suggested, "that some of the cases of leontiasis ossea are examples of ostitis deformans, the disorder which Paget described in 1877," and they refer to Carl Beck's case, (*Surg. Gyn. and Obst.*, Vol. 4, p. 710, 1907) of leontiasis ossea, published in 1907, which he depicts with typical illustrations of Paget's disease with thickened clavicles, deformed thorax, the characteristic transverse abdominal sulcus, and curved thighs, but with one of the facial malformations of leontiasis ossea.

It would appear probable, therefore, that the condition known as leontiasis ossea is part of the general manifestation known as ostitis deformans and that its differences are due more to the reactionary nature of the bone involved, than to the

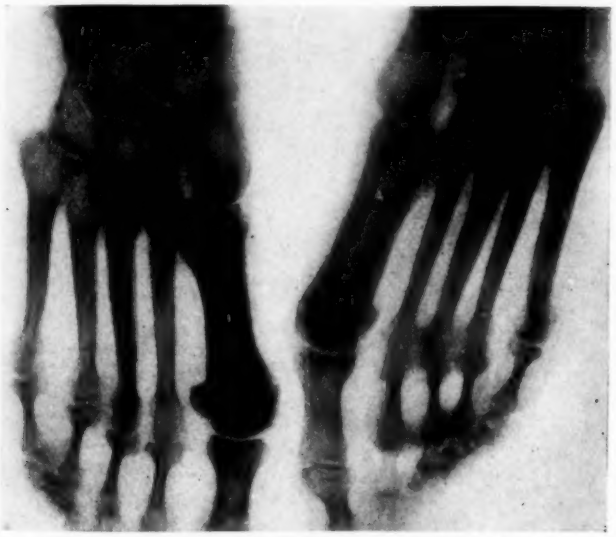

Fig. 8. I. F. Ostitis deformans of metatarsal bones.

disease itself. The chief difference between the two conditions is one of anatomical distribution. If this be true, the term leontiasis ossea could advantageously be stricken from our nomenclature, and the term ostitis deformans of the jaw substituted.

Althouth ostitis deformans and ostitis fibrosa cystica present decided clinical differences, upon histological analysis, their differences are more in quantitative ratio than in fact.

In ostitis fibrosa cystica, the fibrotic change is paramount. In the generalized form of this disease, all of the long bones tend to become involved. The fibrosis extends throughout the marrow cavity. Decalcification of cortical bone occurs with fibrous replacement involving the entire structure leaving only a shell of lamellar bone covered by periosteum. The consequent softening is frequently followed

by bowing and bending which, in turn, in accordance with Wolff's law, is followed by bone regeneration, especially on the concave surfaces. Along with the fibrotic change, is a strong tendency to the formation of cysts.

The cyst formation is probably the result of regressive changes of fibrous tissue, which completes its cycle in the stage of liquefaction. Cysts developed in this manner contain no lining membrane and continue to enlarge in a centrifugal direction, destroying lamellar bone, being limited in their expansion by a thin layer of cortex and periosteum.

In ostitis fibrosa cystica, along with the decalcification and fibrosis, the osteogenic factor is nevertheless always present, as characterized by the unusually prompt and good bony union following fracture.

Some cases proceed with the formation of large bony bosses or giant-cell growths, while others show no signs of osteogenesis. It is a peculiarity of bone that side by side may appear the antagonistic processes of osteogenesis and osteolysis. In this disease, it is quite probable that osteolysis is the prevailing factor, and that in accordance with Wolff's law, osteogenesis occurs only after the bendings or bowing, as a corrective or beneficent reactive process.

In a case reported recently of the generalized form of ostitis fibrosa cystica, (E. H. Eising: *Jour. Bone and Joint Surg.*, July, 1925) there were no bending deformities and, in consequence, there was nowhere any evidence of new bone formation. Osteogenesis appears, therefore, to be a latent function in ostitis fibrosa cystica.

Trabeculation, which represents uncompleted resorption, is not found as frequently in bone cysts at operation as the roentgenogram would indicate. The roentgenographic appearance of trabeculation is often produced by irregularities in the walls surrounding the lesion.

A feature common to this entire disease group is the rapid healing of fracture. This rapid healing is true not only of fractures, but also following operation for correction of deformity. Why this should be the case is itself an interesting question and worthy of thoughtful consideration.

The solitary bone cyst is frequently spoken of as localized ostitis fibrosa cystica, in contradistinction to the generalized form of that disease. This error, for it is truly an error, has crept into our nomenclature, probably on account of the similarity between the roentgenogram of the solitary cyst to that of the cysts occurring in ostitis fibrosa. Pathologically, they are quite dissimilar, and there is no good reason for confusion of the terms.

The solitary cyst is a lesion usually of the diaphyseal end of long bones and, as maintained by Virchow (Ueber die Bildung von Knochencysten, *Monatsch. Berl. Akadem. d. Wissensch.*, 1876), all osseous cysts are the softened products of degeneration of growths that were solid formerly. Such solid tumors may have originated from erratic cartilaginous fragments left from the epiphyseal line. Such cysts are usually surrounded by a definite cyst wall of fibrous tissue, and in the cyst wall cartilaginous fragments have been found by Schlange (Beitrage zur. Anat. und klinische Kenntniss der Knochencysten. Festschrift feuer Esmarch, 1893, p. 431) Franz Koenig (*Langenbeck's Archiv.*, Bd. LVI, Heft 3.), Deetz (*Beitr. z. Klin. Chir.*, Bd. XXVI, Heft 1.) and subsequent observers.

Depending upon the age of the cyst or, rather, the degree of degeneration, the contents may be a clear, colorless fluid or, as in the cases reported by Carl Beck, (Osseous cysts of the tibia, *Am. Jour. Med. Sc.*, June, 1901, pp. 666–671) it may be filled with black, bloody, viscid serum, in which the cavity is traversed by a few fibers of osseous remnants. The solitary bone cyst is essentially a juvenile bone lesion occurring in childhood or early adolescence and not in later life as do the cysts of ostitis fibrosa cystica.

Such are the true bone cysts, differing from those of ostitis fibrosa cystica in etiology, pathology and process of repair.

There are, however, certain cysts, which when first observed are solitary, and which do present great similarities to ostitis fibrosa cystica; and it is this small group which I would classify with that disease.

Two such instances have come under my observation. The characteristics of these cysts are, that they have no lining membrane, small masses of bone may be recovered in these cysts which show the active process of fibrosis and, lastly, they do not respond with the production of new bone and healing, as do ordinary cysts.

It is possible that these cysts represent an early stage of ostitis fibrosa cystica before the process has become generalized.

We have observed recently that ostitis fibrosa cystica and solitary bone cyst are both accompanied by a marked leucopenia. Our observations have not been sufficiently extended to determine whether this is an invariable accompaniment of the disease or not.

In no case of giant-cell tumor have we found a leucopenia. Leucopenia may therefore prove to be a valuable aid in the differential diagnosis between giant-cell tumor and bone cyst.

Figures 4 to 8, inclusive, are of a typical case of ostitis deformans as originally described by Paget.

Illustrative of the painlessness and gradual progress of the disease is the fact that the patient complained only of ulcerations and scaliness of the skin over the left tibia. This symptom is described by Paget, and occurred in several of his cases.

The patient is a negress, 55 years old, born in Brooklyn and married 37 years. About 7 years ago she noticed an outward bowing of the tibiae. Gradually she assumed a stooping posture. At no time did she consider herself sick enough to seek medical advice. The photograph portrays the classical gorilla-like attitude, with head sunk upon the chest, the spine generally curved, the legs bowed outward, the round shoulders, the protruding sternum and the transverse abdominal sulcus.

# DISLOCATION OF THE INFERIOR END OF THE ULNA

## SUGGESTION FOR A NEW OPERATIVE PROCEDURE

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DISLOCATIONS of the inferior end of the ulna form an interesting and somewhat perplexing problem in the chapter on the injuries occurring about the wrist joint. While they sometimes arise as the result of a purulent arthritis or an osteomyelitis, they are usually associated with fractures of the bones entering into the formation of the wrist. Among these Colles' fracture is most frequently to be noted. Ordinarily, the treatment instituted for the cure of the fracture is sufficient to insure the repair of the torn radio-ulnar ligaments. However, in a larger percentage of the cases than has been believed, so favorable an outcome has not been achieved. Cotton[1] has noted that after Colles' fracture, a looseness of some or all of the radio-ulnar ligaments is common. Indeed, he has said that "a serious, crippling range of abnormal mobility with ulnar nerve irritation is not rare. Within eighteen months, I have seen six such cases, all completely disabling." In cases of this sort the disabling effects of the fracture become relatively slight and the dislocation, previously considered as of secondary significance, assumes a rôle of primary importance. A somewhat similar situation is encountered in fractures of the upper third of the ulna associated with dislocation of the head of the radius. Of this so-called fracture of Monteggia, Malgaigne said, "always suspect a dislocation of the radius in fractures of the ulna" and Kirmisson remarked, "the dislocation is all, the fracture nothing."

Although dislocation of the ulna is most frequently the sequel of a fracture, it may occur without any coincident or antecedent bone lesion. Some forty or fifty cases of this type of isolated luxation of the ulna have been described. Most commonly, they are of the anterior variety, but a fair number of posterior dislocations have also been reported. Which of these dislocations has occurred in a given case has depended on whether the wrist happened to be in supination or in pronation at the time the injury was received. Usually they are due to sudden, severe traumata similar in character to those that produce Colles' fracture. Occasionally, however, they have been due to long-continued, minimal traumata of an occupational nature, as in the case reported by Rognetta.[6] In discussing this case, Courtin[2] called attention to the fact that the important ligamentous structure in the inferior radio-ulnar articulation is the triangular ligament. In the movements of pronation and supination, this ligament was stretched and acquired a laxity sufficient to account for the subluxation.

Among young children, a somewhat analagous lesion, anterior luxation of the triangular cartilage, seems to be not uncommon. It appears that as a result of swinging the child upward by the hands, an injury is produced which causes great pain and which prevents supination of the forearm. Because the pain has appeared to be located in the elbow or even in the shoulder, the real site of the lesion has been overlooked. Goyrand[4] studied several hundred of these cases, both clinically and at the autopsy table, and came to the conclusion that the condition was due to a relaxation of the ligaments and a relative disproportion between the head of the ulna and the articulating surface of the triangular cartilage. As the hand was twisted into pronation, the lower end of the ulna rotated backward until its anterior end slipped beyond the posterior edge of the cartilage. In this position it became locked and interfered with

attempts to supinate the forearm and reduce the luxation.

All three of these conditions have been characterized by more or less extensive lesions to the ligamentous strutures about the wrist joint. Exactly what occurs can best be understood by briefly reviewing the anatomy of the joint and the mechanics of its actions. The inferior radio-ulnar articulation is a pivot joint formed by the lower end of the ulna and the shallow sigmoid cavity of the lower end of the

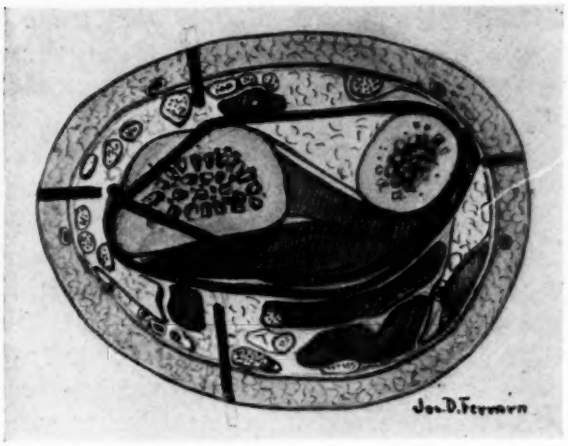

Fig. 1. Schematic drawing showing lines of incision and arrangement of fascial graft for anterior dislocation of ulna.

radius. It is supported by a delicate capsule which is inserted around the edge of the sigmoid cavity and the outer two-thirds of the head of the ulna. The articular capsule is reenforced anteriorly and posteriorly by narrow fibrous thickenings which extend from the edge of the sigmoid cavity to the head of the ulna, and which have been designated the anterior inferior and posterior radio-ulnar ligaments. These are rather loose, to allow for the extensive rotatory movements of the wrist and, except at the extremes of rotation, are of only secondary value in maintaining the relative positions of the two bones. The main bond of union between the lower ends of both bones is the so-called "triangular" cartilage. This is a fibro-cartilaginous structure roughly pyramidal in shape which is attached at its base to the edge of the sigmoid cavity and at its apex to the root of the styloid process of the ulna. It is quite thick at its ulnar insertion but very thin at its radial attachment. Although its main purpose consists in preventing the lateral separation of the ulna from the radius, it also serves to fill in the space between the end of the ulna and the convex upper surface of the carpal bones.

The sole movement of the joint is rotation. This apparently simple motion is, in fact, quite complicated and involves the participation of the elbow and even of the shoulder joint in its completion. These auxiliary movements, however, will not be discussed at this time. Motion at the lower radio-ulnar articulation consists of a rotation of the radius about an axis that extends from the center of the head of the radius to the center of the head of the ulna. As the radial styloid rotates, it describes an arc of about 160°. At the same time, the styloid process of the ulna moves in a similar and smaller arc about the same axis but in the opposite direction. The extent of this motion is limited partly by the intrinsic ligaments of the joint and partly by the interposition of soft tissues. The main check in preventing extreme pronation or supination is the ligament of Denucé, a quadrilateral band of fibers connecting the head of the radius with the lesser sigmoid cavity of the ulna. Doubtless, the inferior radio-ulnar ligaments also play some part in controlling the rotation action at the extremes of motion. When the hand is pronated, the anterior inferior ligament is relaxed and the posterior is put on the stretch. As the hand is rotated back into supination, the opposite occurs. However, the main value of these external ligaments lies in their preventing excessive backward or forward displacement of the lower end of the ulna on the radius. In limiting lateral displacement the primary source of strength resides in the integrity of the internal bond, the triangular ligament. For this function it is admirably adapted by its pyramidal

conformation. By transforming the thin, wide attachment along the radius into a thick, narrow attachment along the ulna, the utmost mobility of the two bones on each other is retained without in the least decreasing the strength of the force holding them together.

As has been mentioned before, those who have recorded the pathological findings have described, along with relaxations or ruptures of the inferior radio-ulnar ligaments, a stretching or tearing of the interarticular cartilage. Quite recently, Wilson and Cochrane[9] reported a case of chronic recurrent luxation of the ulna in which, at operation, "the attachments of the discus articularis and the ulnar lateral ligament were found torn across." In discussing the ulnar complications of Colles' fracture, they have noted that "the backward and upward displacement is marked, strain is exerted through the internal lateral ligament on the ulnar styloid and this is frequently fractured. In other cases, it is the ligamentous attachment of the fibro-cartilage which gives way instead, or the cartilage may be torn across." In all the pathological reports, emphasis has been placed on the fact that the triangular cartilage is among the structures that have suffered injury. Yet, in undertaking treatment for this condition, the greatest stress has been put on the tearing of the radio-ulnar ligaments while the injury to the triangular ligament seems either to have been neglected or to have been considered as of secondary consequence.

Patients with dislocations of the ulna seldom complain of pain. They usually apply for relief from the weakness and sense of insecurity experienced on performing movements of rotation. In the anterior dislocations the ulna dislocates anteriorly on extreme supination of the hand, while in the posterior variety the ulna is displaced poteriorly on pronation. The lower end of the bone can be felt and seen projecting under the skin and there is a definite narrowing of the wrist. The fresh dislocations are usually easily reduced by separating the ends of the forearm bones and applying pressure directly over the head of the ulna as suggested by Desault. The difficulty, however, arises in maintaining the reduction. Because of the shallowness of the sigmoid cavity and the looseness of the ligamentous structures, there is a great tendency to recurrence of the luxation. Very frequently, even prolonged immobilization is of no avail in bringing about a permanent cure.

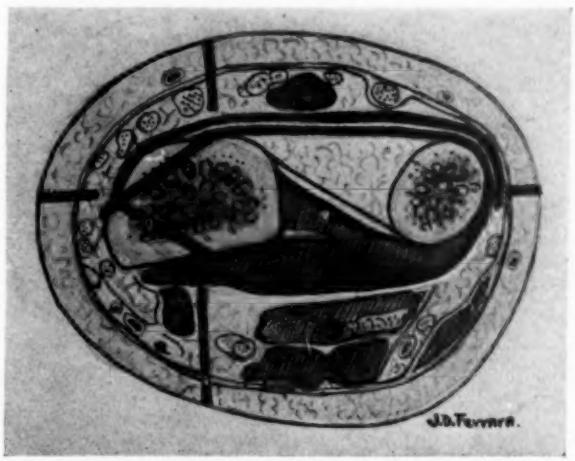

Fig. 2. Schematic drawing showing lines of incision and arrangement of fascial graft for posterior dislocation of ulna.

Apparently trivial in itself, this condition appears to have afforded surgeons no little annoyance, and a variety of procedures has been suggested for its cure. Von Mayer[8] advocated the use of an arm band so modified as to permit the application of graduated pressure over the head of the ulna. Hoffa[5] reported three cases in which he was able to prevent recurrence by the simple procedure of passing several wire sutures through the periosteum of both bones. Darrach[3] advised the wearing of a leather wristlet such as is commonly employed in the treatment of sprains of the wrist. When this proved ineffectual, he performed a resection of the lower end of the ulna. Cotton, Monks, Goldthwait[1] advocated osteotomy of the lower end of the radius with the idea of tightening the inferior

radio-ulnar ligaments. Wilson and Cochrane[9] introduced a fascial ligament to unite the ulnar portion of the triangular cartilage with the posterior surface of the head of the ulna. Hoke treats the condition by drilling holes through both bones and

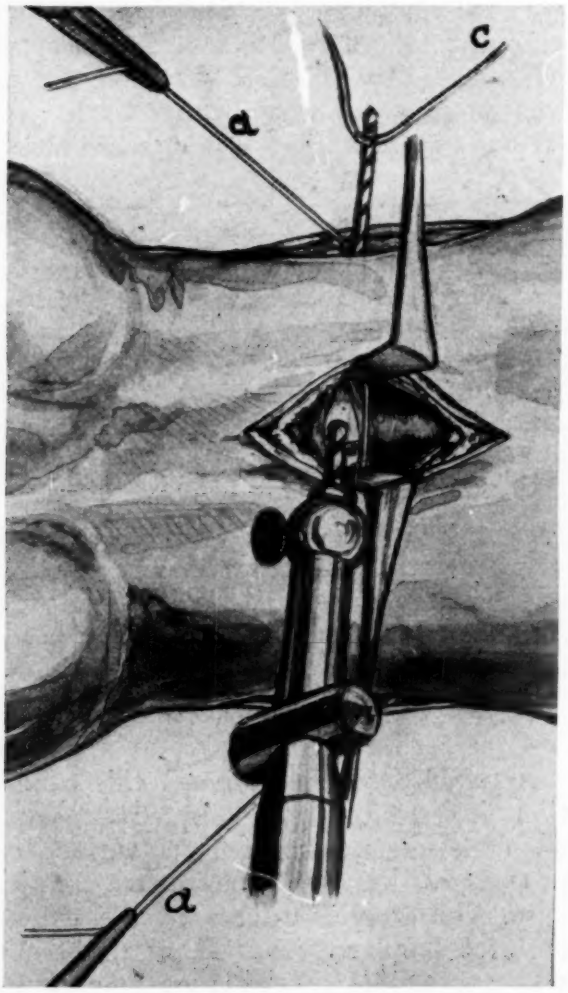


Fig. 3. Ventral incision showing pronator quadratus with guide suture *a* running across it and emerging at the radial and ulnar incisions. The bone drill emerging at radial incision is being threaded with guide suture *c*.

passing through these a fascial band to hold them in their proper relative positions. In practically all of these operations the primary purpose has apparently been the restitution of the function of the external ligaments. No attempt was made, however, to restore the action of the injured triangular cartilage.

In the operation here suggested, an effort has been made to replace the intrinsic ligaments of the joint by a fascial graft which, while supplying the stabilizing force of the triangular cartilage, will not interfere with freedom of motion permitted by the radio-ulnar ligaments. In principle, the operation involves the creation of a fascial sling which is attached to the radius and encircles the neck of the ulna. By appropriately tightening this sling before suturing it to the radius, the ulna is drawn snugly into the sigmoid cavity and held there. This fascial band simulates both the triangular and the radio-ulnar ligaments in function. The action of this latter ligament may be reenforced by the formation of a new inferior radio-ulnar ligament. Depending on whether the anterior or the posterior ligament happens to have been torn, the excess of the fascial strip is passed anteriorly or posteriorly to the radius and sutured to the ulna slightly below the level of the sling. (See schematic Figures 1 and 2.) By this arrangement the sling serves to prevent lateral displacement of the ulna while the newly formed radio-ulnar ligament tends to obviate dislocation in an anteroposterior plane.

The procedure is carried out through an incision 1 inch in length along the medial border of the ulna about ½ inch above the tip of the styloid process. The flexor carpi ulnaris is identified and retracted forward while the extensor carpi ulnaris is retracted backward. The edge of the pronator quadratus is then seen lying at the bottom of the wound. By blunt dissection, a tunnel is bored along its anterior surface beneath all the flexor tendons of the forearm. This may be done without any fear of injuring the ulnar nerve or artery, the median nerve or the radial artery since all lie on a more superficial plane. In a similar manner and through the same wound, a dorsal tunnel is next burrowed beneath the extensor tendons to the lateral surface of the radius.

The groove for the extensor ossis meta-

carpi pollicis is located and, slightly medial to it, a second incision is then made along the radius about an inch above the tip of its styloid process. The tendons of the extensor ossis metacarpi pollicis and extensor carpi radialis longior are bluntly separated and the radius is exposed. The tunnels previously formed are found and guide sutures (a) and (b) are passed through from the radial to the ulnar incisions.

For the purpose of drilling holes in the radius to anchor the ends of the fascial sling, auxiliary ventral and dorsal incisions are made. The ventral incision is made between the tendons of the flexor carpi radialis and flexor longus pollicis at the same level as the previous incisions. This exposes a small elliptical space between the latter tendon and the tendons of the flexores sublimis and profundus digitorum through which the pronator quadratus may be seen with guide suture (a) lying on its surface. With a small hand drill, a bone channel running slightly downward, outward and backward is made through the whole thickness of the radius. As the tip of the drill emerges through the radial incision, it is threaded with guide suture (c) and is drawn back and out of the ventral incision. (See figure 3.) In a similar manner, a dorsal incision is made between the tendons of the extensor longus pollicis and extensor communis digitorum. A second hole directed downward and slightly forward is drilled in the radius and guide suture (d) is passed from the radial incision through to the dorsal incision.

These wounds are now covered and a fascial graft about 8 inches long and 1 inch wide is removed from the outer aspect of the thigh. This graft is folded lengthwise on itself so that the smooth gliding surface of the fascia faces outward. The thigh wound is closed by an assistant while the operator, by means of guide suture (d) passes the graft from the radial incision through one of the bone channels, around the neck of the ulna and then by means of guide suture (c) through the second bone channel and out at the radial incision. The hand is put into mid-pronation, the head of the ulna is pulled snugly into the sigmoid cavity and the fascial band is drawn tight so that one end is longer than the other. The free ends of the fascial sling are crossed and at their crossing are firmly sutured to the outer aspect of the radius by means of kangaroo tendon.

The procedure now varies somewhat depending on whether the dislocation is of the anterior or the posterior type. In the latter case, a new posterior radio-ulnar ligament is formed by passing the longer end of the fascial graft from its point of attachment at the radius beneath the extensor tendons to the ulnar side of the forearm. The hand is placed into extreme pronation and through the ulnar incision the fascial end is sutured to the head of the ulna on a plane slightly below that of the newly made sling. In the anterior type of dislocation, the hand is put into extreme supination, the fascial end is passed deep to the flexor tendons and a new anterior ligament is made by suturing the fascial graft to the anterior surface of the head of the ulna. The four incisions are now closed and the hand is immobilized in a cast for ten days to two weeks to allow for complete healing in of the graft. Gentle passive and active motion is then begun.

This operation is somewhat more complicated than those which have been described previously. It is hoped, nevertheless, that because of its attempt at an anatomical restoration of the injured tissues it may prove of interest and value to those confronted with the problem of dislocated ulna. It is believed that some of the annoying disadvantages consequent on the other operations may be obviated. The wearing of a wristlet is at best only a palliative measure while resection of the lower end of the ulna or osteotomy of the radius seem to be somewhat drastic and deforming operations. The use of the

fascial graft for the purpose of restoring injured or torn ligamentous structures has been amply justified by many operative procedures in other situations. The procedure here suggested appears to be based on an appreciation of the fundamental anatomy and physiology of the lower radio-ulnar articulation. Its execution is entirely extra-articular. It leaves no foreign material in the tissues and is fraught with no danger to the important nerve and vascular structures coursing through the forearm.

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# PROSTATOTOMY (ELECTROCAUTERY PUNCH METHOD) IN ADVANCED PROSTATIC CARCINOMA

## REPORT OF THREE CASES*

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IN the three cases of advanced prostatic carcinoma herein recorded, prostatotomy by the electrocautery punch method afforded such marked relief to the distressing obstructive symptoms and so enhanced the comfort of the unfortunate patients, that the procedure seems to have a definite place, as a palliative measure, in the management of inoperable prostatic malignant growths. Obviously no one would exhibit the temerity to claim that a patient with advanced carcinoma in any anatomic situation could be permanently relieved, or, indeed, life greatly prolonged, by the excision of a small section of the involved tissue. Moreover, it is not unknown that incomplete removal of a malignant neoplasm wherever located tends to stimulate rather than retard its progress. These facts were given due consideration before prostatotomy was performed as a palliative measure in the cases reported.

The three patients were treated in the Louisville City Hospital, and the diagnosis had been made before they came under my observation. In each case it was confirmed by pathological examination of tissue removed by the electrocautery punch procedure.

CASE I. H. W., white, aged 69, was admitted July 24, 1925. His urine had been withdrawn by catheter once daily for several days. For a year he had had dysuria, and the stream gradually became smaller.

The patient was a well developed, fairly well nourished and well preserved individual for his age. Vesical dulness extended about 8 cm. above pubis; no abdominal mass. Symmetrically enlarged and fairly firm prostate noted on rectal palpation. Blood pressure 142/90. Urine orange in color, turbid, acid, sp. gr. 1012; albumin two plus; no sugar. Roentgen-ray examination of abdomen and pelvis revealed no renal nor vesical calculi. There was marked lipping of all lumbar vertebræ and both sacroiliac joints indicative of chronic osteoarthritis. Blood chemistry: non-protein nitrogen, 26; urea, 12.5.

The patient was catheterized the day of admission and about 400 c.c. of dark, blood-tinged urine withdrawn. This was repeated for three days. The fourth day after admission a suprapubic cystostomy was performed under gas-oxygen-ether anesthesia. The vesical mucosa was fairly clean; there was a small tongue-like upward projection of median prostatic lobe and slight intravesical bulging of entire prostate. A small section of the gland was removed with specimen forceps and suprapubic drainage was instituted. No complications followed the operation. Pathological diagnosis of tissue excised: adenocarcinoma.

After four weeks of suprapubic drainage prostatotomy was performed with the electrocautery punch under anesthesia with one-half grain of cocaine. The section of tissue removed also was reported adenocarcinoma. There were no postoperative complications nor sequelæ. Four days afterward a retention catheter (Malcot) was introduced through the urethra. The suprapubic wound healed readily. The catheter was removed in twelve days, and the patient urinated normally thereafter. Repeated roentgenograms of the pelvis disclosed no evidence of bone metastasis. The patient was dismissed from hospital October 1, 1925, but was advised to return to the out-patient department at frequent intervals for observation.

Résumé of treatment: Retention catheter on admission; irrigation with hypochlorite or potassium permanganate solution; forced fluids; formic acid; tincture of digitalis; acid sodium phosphate. Suprapubic drainage; prostatotomy with electrocautery punch; retention catheter in urethra twelve days.

NOTE.—June 1st, 1926: This patient has had no symptoms of urinary obstruction since dismissal from

* Read before the Louisville Urological Society, Louisville, Kentucky.

hospital after the electrocautery punch operation. He is living in comparative comfort and able to work every day as a laborer.

Case II. S. K., colored, aged 50, admitted May 13, 1925. Retention of urine, which had been preceded by pollakiuria, dysuria and straining.

According to the patient's statement, the pollakiuria began several years ago, but had been worse since August, 1924. There had been nocturia, straining during urination, painful at times; no hematuria; no less of weight.

Physical examination: The patient was well developed and fairly well nourished, rather aged in appearance, with gray hair and an expression of pain. Heart showed normal rhythm, no murmurs; pulse weak. There was no evidence of abdominal tumor; kidneys not palpable; vesical dulness 6 cm. above pubis. External genitalia normal. Rectal examination: prostate large, nodular and with no definite boundaries; slightly tender. Urine amber in color, clear, acid, albumin two plus; no sugar; a few leucocytes; residual urine 500 c.c. Blood examination: leucocytes 9,000; polymorphonuclears 58%; lymphocytes 28%; transitionals 4%; erythrocytes 4,100,000; hemoglobin 60% to 70%. Wassermann reaction negative. Blood chemistry: May 18, 1925, non-protein nitrogen 33.3, urea 16.6; May 27th, non-protein nitrogen 39.9, urea 18.0; June 6th, non-protein nitrogen 34.2, urea 18.6; June 16th: non-protein nitrogen 24.3, urea 11.5. Phenolsulphonephthalein test: May 27th, first hour 5%; June 1st, first hour 5%, second hour 10%. Roentgen-ray examination of pelvis negative for calculi or metastasis.

Cystoscopy: Urine turbid; vesical walls congested, evidence of low grade cystitis. Ureteral orifices normal. Residual urine 500 c.c. Intravesical prostatic bulging slight. Prostate mottled in appearance, suggestive of neoplastic formation.

June 2, 1925: Suprapubic cystostomy under gas-oxygen-ether anesthesia; small section of prostate removed; suprapubic drain introduced. Pathological report: adenocarcinoma. Suprapubic drainage continued until August 31st, when electrocautery punch operation was performed under anesthesia with one-half grain of cocaine. A fairly good sized piece of tissue was removed. Pathological diagnosis: adenocarcinoma. Three days later a retention catheter (Malcot) inserted through urethra; the suprapubic wound healed readily. Able to urinate normally when dismissed from hospital October 1, 1925, but was advised to return to the out-patient department for observation.

Résumé of treatment: Retention cathether on admission; irrigation with hypochlorite or potassium permanganate solution; forced fluids; tincture of digitalis; hexamethylenamine; acid sodium phosphate. Suprapubic drainage. Electrocautery punch operation; retention catheter for ten days.

Note.—June 1, 1926: Remained well, and free of urinary symptoms when he moved to Guthrie, Ky., three months after dismissal from hospital. The only information that can be obtained is that there was no recurrence of urinary obstruction; that the patient died from "intestinal trouble" on March 31, 1926.

Case III. R. H. H., white, salesman, 64, admitted to hospital three times; left without permission on previous occasions. His general health had been good until pollakiuria, nocturia and dysuria developed four years ago; urination gradually became more difficult; stream small and required straining. Had had recurrent Neisserian infection since he was a young man; denied lues. Average weight 155 pounds; present weight 110 pounds.

In March, 1924, the patient consulted a physician who found the prostate enlarged, residual urine 450 c.c., and the first stage of suprapubic prostatectomy was then performed. At the second stage of the operation it was decided that the growth was malignant and surgery was abandoned. The patient left the hospital with the suprapubic drain in situ. His condition failed to improve and he became weaker.

On April 10, 1925, he was brought to the hospital by police patrol after falling down stairs and cutting his forehead. His mental condition was then poor and he was in a semi-comatose state. The suprapubic sinus was kept open for drainage and fluids were forced. After eleven days he was much improved and left the hospital without permission.

On June 7th he was readmitted in a semi-comatose condition. He was again treated by forcing fluids and he promptly rallied. The bladder was drained and irrigated through the suprapubic opening. On June 13th he again left the hospital without permission, and June 26th was readmitted in an irrational state.

The patient was then well developed but emaciated, gray-haired, and gave evidence of

marked debility; skin dry, pale and sallow; facial expression one of exertion and weakness. Liver extended about 8 cm. below costal border in right nipple line; kidneys not palpable. Median suprapubic scar with draining sinus; no excoriation of skin. By rectal examination the prostate was enlarged, very firm and nodular. There was some edema of the feet and ankles.

Blood: leucocytes 5,600; polymorphonuclears 65%; lymphocytes 27%; transitionals 7%; eosinophiles 1%; erythrocytes 2,900,000; hemoglobin 50%. Wassermann reaction negative. Urine: amber, slightly cloudy, acid, sp. gr. 1012; no sugar, abundant pus cells. Phenolsulphonephthalein test: April 11th, first hour 10%, second hour 5%; April 17th, first hour 5%, second hour 20%. Blood chemistry: April 17th, non-protein nitrogen 28.5, urea 14; June 12th, non-protein nitrogen 25, urea 11.5; August 22nd, non-protein nitrogen 26.8, urea 11.7. Roentgen-ray examination July 15th showed mottling throughout both lung fields and haziness in both apices; evidence of cavity formation in right apex. Radiogram of pelvis, including lower three lumbar vertebræ and proximal portions of femora, showed mottling throughout all the bones included in the radiogram. Findings suggested metastases.

The drainage through the suprapubic opening continued, and the skin was kept in good condition by the use of zinc oxide-paraffin ointment. The patient's temperature ranged from 97° to 103° F., septic in type.

August 31, 1925, the electrocautery punch operation was performed under sacral anesthesia. The procedure was painless and without hemorrhage. Three days afterwards a retention catheter was introduced through the urethra. Cystoscopy preceding the punch operation showed the vesical mucosa clean, median bar prostatic hypertrophy, no erosions. Specimen obtained was of good size. Pathological diagnosis: adenocarcinoma.

About two weeks after the punch operation the patient began urinating entirely through the urethra, and the suprapubic wound healed. After this his temperature remained normal but his general condition was not improved, and he complained of diffuse pain throughout the body.

Résumé of treatment: Forced fluids; codein and aspirin with morphine for relief of pain; vesical irrigation; cautery punch operation; retention catheter.

Note.—June 1, 1926: Died of metastatic involvement about two months after dismissal from hospital.

I believe that the palliation secured by prostatotomy by the electrocautery punch method employed in the foregoing cases justified the procedure.

Two of the patients had remained under observation in the hospital for several months. In all the cases the diagnosis of prostatic carcinoma had been made, the disease had progressed to what was considered the inoperable stage, and nothing further could be promised the unfortunate patients from radical surgical treatment. In only one case was metastasis definitely determined by roentgenographic investigation.

All three patients had sufficient prostatic enlargement to produce urinary obstruction, and catheterization had been necessary for varying periods of time. The physical status of two of the patients was fairly satisfactory; the third was decidedly below normal both physically and mentally. After use of the electrocautery punch the patients were able to urinate through the natural channel without discomfort or straining, and expressed themselves as feeling greatly relieved.

While prolongation of life cannot be positively promised patients with inoperable prostatic growths after employment of the electrocautery punch, if the distressing symptoms incident to urinary obstruction can be alleviated and greater comfort assured for these unfortunates during the period they are permitted to exist, certainly no one can deny that something worth while has been accomplished.

The technique of the procedure—performed essentially according to the method of Caulk—is not difficult of execution; it entails relatively no clinical dangers; it is done under local (or sacral) anesthesia; in competent hands it is attended by no complications and is followed by no sequelæ; repeated operations may be performed if required; practically no contraindications are yet apparent.

In prostatic malignancy, where radical surgical intervention would probably hasten rather than retard the inevitable fatal

termination, prostatotomy by the electrocautery punch method is believed to have a definite field of usefulness, for the following reasons:

(1) Urinary obstruction is promptly relieved and the patient is thereafter able to urinate through the normal channel without discomfort.

(2) The operation is relatively without danger and may be repeated should necessity arise because of recurrence of obstruction.

(3) So long as the patient enjoys freedom from urinary symptoms his general physical status improves and there is a possibility that life may be prolonged.

(4) The period of hospitalization is minimized, as illustrated by the promptness with which the patients were dismissed after the punch procedure in the cases herein reported, thus making possible a marked reduction in the expense of maintaining charitable institutions.

# A METHOD OF PREPARING VASELINE GAUZE

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NEW YORK

I DEVELOPED the following method of preparing vaseline gauze to facilitate its use in conducting the Carrel method in the treatment of wounds, and in any other case where it may be desirable to use it. The difficulty I have found with the vaseline gauze as ordinarily prepared, is that the oblong pieces as laid in the tin container are difficult to pick up because of the cohesion of one piece of gauze to the other, which, when the operator's hands are sterile rather precludes his holding the box with one hand while he lifts the gauze out with sterile forceps in the other. The method suggested is as follows:

Two cylindrical tin cans are used. The cans I have used are empty plaster of Paris tins. These are better if they are stamped out rather than those with the turned seams, because the turned seams are usually not absolutely tight to melted grease, and if they are held with a soft solder, very little heat in melting the grease is apt to melt the solder, and cause the can to leak. Let us say that we take cans four inches high and about three inches in diameter. Two are needed. A piece of tin, three and one-half inches wide and four inches long, is shaped as shown in figure 1. The flanges are bent at each end and the intervening portion is rolled into a cylinder; that is, the tin is rolled in a cylindrical fashion with the two ends bent toward the lumen of the cylinder in such a way that they rest side by side and form a diaphragm across the diameter of the cylinder which can be grasped by forceps at either end. When completed this cylinder should be about three-quarters of an inch in diameter. A three-inch gauze bandage is then attached to this cylinder of tin by simply forcing the end down between the two internal flanges with a knife. The bandage is then rolled about the cylinder until the end is reached. If more bandage is required, the end of the new bandage is simply laid under the end of the rolled one and sufficient bandage is added until the roll fits into the can with about one-quarter of an inch clearance all around. The roll of bandage is then introduced into one of the cans and melted vaseline is poured upon it until it comes almost to the top of the can, totally submerging the gauze. The can is then gently heated until the gauze absorbs all the vaseline that it will. Melted vaseline is then added until there is an abundant surplus. The tops are then placed upon both cans, one of which contains the vaseline gauze, the other being empty. These tops should have a very small hole punched in the center to release air.

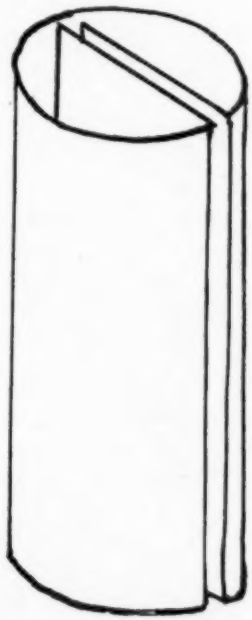

FIG. 1. Shape of tin spool upon which gauze bandage is wound.

These cans are autoclaved without vacuum as solutions are. Upon their removal from the sterilizer the vaselined can is inspected and if the gauze is not still submerged, melted vaseline is added and the gauze is resterilized. The gauze takes up considerable grease, and in order

to have a properly prepared gauze, a surplus of grease must be assured. The container is then set away until it is cooled thoroughly. The top is then removed from the can and the outside of the can containing the gauze is gently, but quickly, heated over a Bunsen flame or gas stove until the outer layer of vaseline is melted just sufficiently to permit withdrawal of the roll, which should have been wound tightly enough to remain intact upon its withdrawal. The central diaphragm is grasped with a good sized sterile artery clamp and the roll of gauze is transferred from the can in which it has been prepared to the empty sterile can, and the top is put on. It is then ready for use.

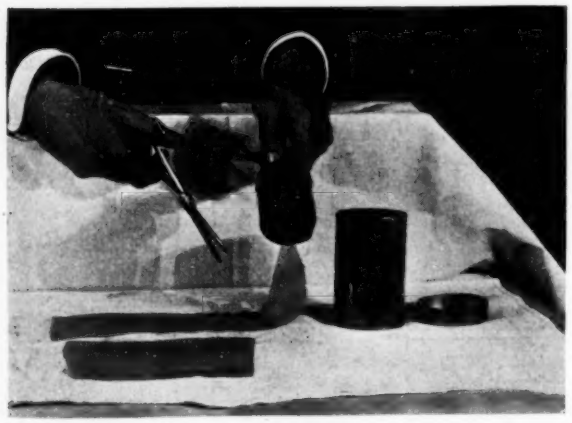

Fig. 2. Showing manner of holding spooled gauze in artery clamp and cutting off strips of vaselined gauze on a sterile towel. The tin can container is also shown.

To use this gauze, before the operator puts on his gloves, he removes the top of the can containing it. He then puts on his gloves and when he desires some of the vaseline gauze, he lifts the roll from the can by grasping the diaphragm with a clamp that does not have mouse teeth, and with sterile forceps unrolls a sufficient length of gauze on a sterile towel, cutting it off with uncontaminated scissors. He may cut off as many pieces as he requires, laying them on top of one another. If one can is allowed to the patient, the free end of the gauze may be laid on the skin, made to adhere, and rolled into place, then cut off to the desired length. Having cut off the amount of gauze required, the roll is returned to its container and covered.

The advantages of this method are: (1) it provides simplicity of preparation, (2) it affords any desired length of strip, (3) it does away with a second assistant, (4) it obviates the two clamps which the assistant must use, (5) it permits a surgeon to do his dressing alone, (6) there is less difficulty in picking up the free edge of the gauze, (7) it affords a beautiful and uniformly greased gauze.

With a little care in saving the grease which may remain in the can and from the first coil or two that are removed, I believe it will also make for an economy in the use of vaseline.

The materials necessary to make it up are available to every practitioner, and I rather think that in the absence of an autoclave, fractional sterilization could be made use of by means of a water bath.

I offer this as an aid in applying the Carrel treatment to wounds and with no idea of departing from the rigid rules laid down by Dr. Carrel for his technique.

The usual care must be taken not to contaminate the roll of gauze while in use, and in sterilizing the container without vacuum.

# CONGENITAL STRICTURE OF THE ESOPHAGUS

## A CASE REPORT*

URBAN MAES, M.D., F.A.C.S.

NEW ORLEANS

BABY L., white male, was admitted to the pediatric service of Touro Infirmary (Dr. L. R. DeBuys) February 26, 1926, when 3 days old. The history, as secured from a relative, was that the child was full-term, and that the delivery had been normal, without instrumentation. He had been brought into the hospital from the country at the instance of the local physician because since birth he had vomited after every feeding, no matter how administered or how small in amount; even feeding by medicine dropper had failed, and the maximum amount the child had seemed able to retain was one teaspoonful. Except for a pronounced attack of cyanosis the day before admission there had been no other symptoms.

The infant was well developed and well nourished, weighing about 6 pounds. The anterior fontanelle was small and depressed, with the sutures overlapping, and the scalp was very dry. The left eye showed a slight ecchymosis. The mouth and throat were filled with a thick, whitish mucus, but no deformity was evident locally or elsewhere in the body. The odor of acetone on the breath showed that an acidosis was present, probably due to starvation.

The heart was normal, but coarse mucous râles were present over the lungs, and no breathing sounds were audible on the right side. When the examination was repeated 12 hours after admission, both crepitant and subcrepitant râles were present, the resonance was slightly impaired, and the breath sounds were increased.

Hypodermoclysis was performed immediately on admission (75 c.c. of 1 per cent glucose solution) and repeated in 4 and in 12 hours. Feeding by medicine dropper with a standard formula resulted in immediate regurgitation of the milk, entirely unchanged by any digestive process. Attempts to pass catheters (size 16 and size 12) into the stomach were unsuccessful, and it was suspected that an obstruction was present about 5 inches down the alimentary tract.

At this time fluoroscopic examination showed the catheter coiled in the esophagus, about the level of the aortic arch. Injection of barium through the catheter showed a marked dilatation of the esophagus, with complete stoppage of the barium at the point described. Serial plates confirmed these findings, and showed that not a trace of the barium had entered the stomach. The conclusions of Dr. W. F. Henderson, roentgenologist, that a congenital atresia of the esophagus was present, confirmed the clinical diagnosis made by the intern on the pediatric service, Dr. H. L. Leopold, to whom is due the credit for detailed study of the case.

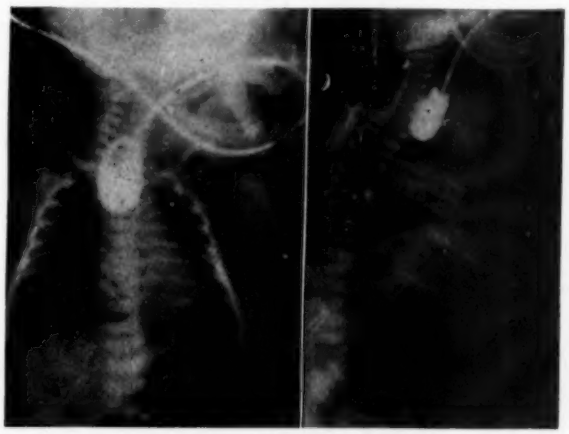

FIG. 1. Stomach tube and barium meal at the level of the stricture. Antero-posterior and lateral views.

When I was asked to see the child, some 20 hours after admission, operation was unmistakably indicated, and was done as soon as permission could be obtained from the parents. Under light ether narcosis a typical Ssabanajew-Franck gastrostomy was done without special difficulty. The child stood the operation well, but when the dressings were being applied he stopped breathing and became quite cyanotic for a few moments. Resuscitation with oxygen was accomplished with little difficulty.

For the first few hours after operation he was fairly comfortable, then the temperature rose rapidly from 100° to 105°, the pulse became proportionately high, cyanosis ensued, and death occured 14 hours later, apparently from respiratory failure.

* From the Department of Pediatrics of Touro Infirmary.

Postmortem examination showed no communication between the stomach and the esophagus from the level of the arch of the aorta above to the level of the bifurcation of the trachea below. There was a diverticulum of the ileum about 18 cm. from the ileocecal opening. The thymus was much enlarged and extended almost to the diaphragm, but otherwise no congenital abnormalities were noted.

FIG. 2. Postmortem roentgenogram, showing barium injected from above through the mouth to the level of the stricture, and from below through the gastrostomy opening.

Lobular pneumonia was evidently the immediate cause of death.

Partial stricture of the esophagus is a relatively frequent condition, but since complete congenital stricture is rare, I feel justified in adding the above case to the number already reported in the literature. Hirsch in 1921 collected 146 cases of complete congenital stricture of the esophagus, to which Vinson in 1923 added another from the Mayo Clinic, which, with the case here reported, brings the total to 148. Several articles on the subject have recently appeared in the continental literature, but since the material is not available to me here, I am unable to say whether they contain additional case reports.

There is little to be added. The condition is always evident within a day or two after birth, and those patients who are brought for treatment later than this will show a partial stenosis and not the complete type. The clinical diagnosis is simple, since regurgitant vomiting immediately after ingestion of the food, and failure to pass a catheter beyond a certain point in the alimentary tract are almost pathognomonic; confirmation should always be sought by fluoroscope or roentgenogram.

Immediate gastrostomy is the only feasible treatment, and no cases of recovery have been reported. On the other hand, the percentage of cures is high in those cases in which atresia is not complete, mechanical dilatation being the usual procedure. Recently Strauss and Hess (1925) reported a new type of direct plastic operation on the esophagus for conditions of partial stenosis, with 2 cures in 3 cases; the third patient succumbed to a pneumonia of the aspiration type on the eighth day, the operation locally being entirely successful.

It might also be added that usually in these cases other types of congenital deformity are associated with the esophageal stenosis, atresia of the anus being the commonest form.

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# TRANSACTIONS OF THE SECTION OF SURGERY, NEW YORK ACADEMY OF MEDICINE

## *MEETING OF APRIL 2, 1926*

THE CHAIRMAN, DR. FREDERIC W. BANCROFT, PRESIDING

## SCARS—A NEW TRIPLE TECHNIQUE FOR REDUCING DISFIGURING CICATRICES TO A DEGREE OF INVISIBILITY AMOUNTING TO PRACTICAL REMOVAL

JAMES FRANCIS GRATTAN, M.D.

NEW YORK

(*Abstract*)

THIS technique is the result of seven years experimentation and has been employed in over 1000 cases with gratifying results. It has been called the Triple Technique for Scar Reduction because of its three elements—surgery, *x*-ray and acid.

The three steps are: (1) Excision of the original scar, and accurate subcuticular suturing with celloidinized silk.

The new surgical wound deliberately made and carefully sutured with non-irritating material heals with a minimum reaction and leaves a "hair-line" scar. The traumatic factors, potent in the production of the disfiguration in the original scar, are absent at the time of the secondary suturing.

(2) *X*-ray treatment of the new "hair-line" scar to prevent over-repair and promote absorption.

The opportune time to check any tendency to over-repair in the new hair-line scar is immediately after the removal of the subcuticular suture. This suture is ready for removal, as indicated by loosening when traction is applied in a see-saw action, about the 10th to the 12th day after its insertion. Accordingly, the first *x*-ray treatment is given on the 14th day.

Dosage—1st treatment—½ of one skin unit, unfiltered. (8″ skin distance, 6″ spark-gap, 60 sec.)

2nd treatment—¼ of one skin unit, unfiltered, in 7 days (same setting of machine, 30 sec.)

3rd treatment—¼ of one skin unit, unfiltered, in 10 days.

(The above schedule permits one full skin unit, unfiltered, in the first month following the operation.)

4th treatment—After a 14 day rest period: ½ unit, filtered through 1 mm. of aluminum.

5th treatment—After a 10 day interval ¼ unit, filtered through 2 mm. of aluminum.

6th treatment—After a 7 day interval ¼ of one skin unit, unfiltered.

(The above schedule gives an additional unit of *x*-rays, ¾ of which is filtered to avoid untoward skin reaction and to prevent overproliferation of the subsurface cells.)

The treatment thus far has consumed two months from the date of the excision. A month's rest is given to allow the well-known delayed effect of the *x*-ray to complete its action before the third step of the triple technique is started.

(3) Acid treatment of any elevations in or around the remains of the hair-line scar to effect leveling and eliminate "shadowing."

Trichloracetic acid was selected because the dermatologists have shown its efficacy in the removal of moles without the production of acid-burn scars. I have used it to the exclusion of the other acids, and have not as yet seen any permanent markings of the skin from its use in leveling down surface irregularities by "scabbing."

Acid Technique—(*a*) Place the patient so that a strong white light strikes the surface at an angle approximating 45°.

This throws the elevations above the surfaces into distinct relief.

(*b*) A wire probe is dipped into the deliquescent fluid of the pure trichloracetic crystals and with maximum care to avoid a *running* excess of the fluid on the probe, *the acid is spread over the elevation only*. As soon as the surface of the treated area turns a "dead" white, cotton saturated with cold water is spread on in a thin transparent sheet. So applied the cotton will stick of itself. The wet cotton should be allowed to remain in apposition with the acid-treated area for five minutes after the "sting" of the acid has subsided. Borated talcum powder may be dusted around the treated area to reduce the contrast between the "dead" white acid effect and the normal skin, or the standard calamine and zinc lotion may be used.

(*c*) Removal of the acid-scab. The white acid-treated area remains so for two days, then gradually discolors into a typical brown scab. This separates at its edges and should be permitted to curl itself off gradually with little or no mechanical urging. Impatience and premature removal of the scab saves no time as one must wait for a second scab to form and complete epithelisation of the new surface level, before any further applications of acid can be attempted.

When the raised area has been brought down, by one or two treatments with the full strength acid, to a plane just above the normal of the surrounding surface, 50 per cent dilution of the acid is used for the subsequent application, and 10 per cent for the final "smoothing" treatment. Seven to ten days should elapse between the consecutive applications to prevent excoriation at any time.

When satisfied that the desired degree of leveling has been obtained, the acid applications should be discontinued until the pink areas left by the separation of the scabs have returned to normal skin color. The true result is then evident. It is, in 90 per cent of cases, beyond the expectations of both patient and operator.

### *Discussion*

Dr. Leon Dufourmental, l'Hopital Laraboisière, Paris (by invitation): I was very much interested in Dr. Grattan's paper and his technique offers a fascinating program to men devoted, as I am, to plastic surgery. The question of avoiding scars is one of the most serious in facial surgery and every method enabling one to eliminate them is an important step forward. I am so afraid of causing scars that I have already tried several different treatments. The last one is the "colored tattoing" which blanches the darker parts and colors the too white ones. In future, however, I shall try the newer method of Dr. Grattan and will be glad to report my results.

Dr. H. H. M. Lyle: Infection and tension are the principal factors in keloid scars. I believe they are of more significance than an inherent tendency.

Dr. Grattan (closing): From the cases I have seen I am inclined to think infection is a big element in the production of keloid. I had one case that would tend to discourage the idea of its being an inherent tendency. It was that of a policeman who, in an automobile accident, was cut by glass. Two scars resulted, one on the face and the other on his neck. Both wounds were obtained in the same accident, at the same time, and under the same conditions of exposure; the one on the face healed by primary union and the one on the neck became infected, necessitating secondary suturing. A keloid scar developed at the site of the neck wound only.

Dr. Frank E. Adair read a paper on Significance of the Discharging Nipple; Microscopic Study of the Discharge as an Aid to Diagnosis. This paper and its discussion is to appear in a later issue of the Journal.

## PRESENTATION OF CASES

### CARBUNCLE OF THE KIDNEY; METASTATIC CORTICAL ABSCESS OF THE FEMUR

PAUL W. ASCHNER, M.D.

THIS patient, Italian, 54 years of age, was admitted to the medical service of the Mount Sinai Hospital, July 1, 1924, complaining of pain in the right lower abdomen, three weeks in duration. The onset was sudden, with chill and fever. There was slight dysuria

for the first two days. The pain decreased, but was exaggerated by deep breathing. There were tenderness in the right lumbar region and some prostatic enlargement. Blood count: w.b.c. 11,600, polys. 80 per cent. Urine: trace of albumin; many leucocytes. At times the urine was negative.

On examining the patient in consultation I observed a well healed scar on the back of the neck and through an interpreter learned that a carbuncle had been incised two months previously. The diagnosis of cortical infection of the kidney was therefore suggested. Ureteral catheterization showed some pus cells in the right specimen, but no functional changes.

Staphylococcus aureus vaccine was administered in the hope of activating the lesion but, instead, the symptoms regressed, and the patient left the hospital August 2, 1924, refusing exploratory operation. A few weeks later he returned because of recurrence of pain and fever, loss of weight and strength. Cystoscopic examination and urine cultures were entirely negative. Roentgenogram of the chest showed elevation of the right diaphragm. At operation there was perinephritis, and on exposing the kidney a carbuncle 3 cm. in diameter was uncovered on its anterior aspect. The kidney was decapsulated, releasing pus from several areas in the carbuncle, and the organ was then surrounded by rubber dam for drainage. Culture of the pus showed staphylococcus aureus. Three weeks later a prostatic abscess was discovered. It ruptured spontaneously into the posterior urethra.

Later, while under treatment in the outpatient department, he complained of pain in the left thigh and on December 5, 1924, a deep swelling in the postero-external aspect of this thigh was noted. This subsequently pointed and was incised, the pus showing staphylococci. A persistent sinus developed which was found to lead to bone. Moreover a periarthritis of the left elbow also appeared which resulted in swelling and marked limitation of motion. A small swelling of the scalp was observed still later.

Unfortunately *x*-ray examinations of the femur and elbow by Dr. Jaches were not ordered until September, 1925. The bones of the left elbow showed no changes, the inflammatory process being confined to the soft parts. The middle third of the femur showed marked thickening of the cortex with a productive periostitis most pronounced on the dorsal and mesial aspect. This cortex and new formed bone showed several small cavities.

At operation, September 22, 1925, incision was made on the external aspect of the thigh. I found a greatly edematous and thickened periosteum, with production of new sclerotic bone, a thickened, sclerosed cortex with several small cavities containing granulation tissue. The process involved about four inches of the femur above its midpoint, and extended posteriorly to its mesial aspect. The effort to remove this dense mass of new formed bone was made difficult by the fact that it surrounded perforating branches of the profunda femoris. Sharp hemorrhage occurred and one vessel had to be secured by leaving a clamp upon it. The medullary cavity was apparently not opened in the process of removing the mass, but cancellous tissue was exposed. Because of the bleeding and oozing packing had to be employed. Subsequently Carrel-Dakin dressings were employed. The process of healing has been slow indeed, probably because the removal of sclerotic bone was not complete on the mesial aspect of the femur, as seen by the postoperative *x*-ray examination.

The sluggish abscess of the scalp also contained staphylococcus aureus.

The elbow has improved greatly with physical therapy.

The prostate has been negative on several examinations.

It is difficult, indeed, to determine whether the bone and joint infections occurred as a metastatic infection from the carbuncle of the neck at the same time as the kidney infection, or whether they were secondary to the kidney lesion. The insidious development and long latent periods in these attenuated forms of staphylococcus infections invalidate the sequence in which the various lesions manifest themselves as a guide to their true chronology.

### *Discussion*

Dr. Walter M. Brickner: This case interested me very much for I have been giving some attention to bone abscesses for a long time. These chronic abscesses are usually residual from an osteomyelitis or, as in this case, metastatic. I reported before the American Medical Association in 1925 three cases of isolated cortical abscess of the femur in young women in whom we could not find by history or examination any antecedent or associated infection, although I have no doubt that there

had been a focus somewhere. There was a fourth case, also at the Hospital for Joint Diseases, presenting exactly the same clinical and roentgenographic picture of a cortical bone abscess in which at operation by Dr. Eising only an empty, dry cavity was found in the cortex of the femur—an appearance unique in my experience. The osteotomy cured her.

I am inclined to think that some of these abscesses that we call cortical are primarily subperiosteal. These chronic bone abscesses, whether cortical or medullary, are sterile or nearly so (attenuated organisms) and therefore they lend themselves to the conservative treatment by simple drill drainage that I have described. In Dr. Aschner's case, however, there was perforation of the abscess through the shaft so that he was not dealing with a circumscribed collection of pus and the treatment had to be osteotomy. He did not mention whether the man had fever at the time; I would assume that he had not.

I had one case in which there appeared to be a small abscess in the intertrochanteric line of the femur, but in which I found only sterile granulation tissue—a circumscribed non-suppurative osteomyelitis. All of my cases made complete recovery and were promptly rid by operation of the only subjective symptom—intense pain, and the only objective sign—localized tenderness.

Dr. Abraham O. Wilensky: I believe that acute osteomyelitis is essentially a thrombophlebitis of bone tissue and that it is one of the phenomena of a general infection. When a thrombus-embolus hits one of the end vessels in the bone, it must necessarily remain there and it becomes, so to speak, encysted. The resulting suppuration is of small extent in the beginning and it takes a very long time for it to develop into the mature bone abscess which is recognizable clinically. That is why so many chronic bone abscesses are sterile when opened, because there has been time enough for the natural processes of the body to dispose of the bacteria. I think, therefore, that all of these chronic bone abscesses are of long standing.

The primary focus in cases of acute osteomyelitis is not always demonstrable (1) because the focus may have completely healed before the patient comes under observation; (2) because the focus may be somewhere in the body beyond demonstration; or (3) because human possibilities may be insufficient to demonstrate the foci when they are accessible.

## OSTEOCHONDROMA OF THE HUMERUS (ENDOSTEAL)

PAUL W. ASCHNER, M.D.

On September 13, 1925 this patient, a girl of 19 years, got up to answer the telephone, lost her balance and threw out her left hand against the wall to steady herself. She experienced a sudden acute pain in the upper arm and lost the use of the arm. She was taken to the Harlem Hospital and a fracture of the humeral shaft at the junction of its upper and middle thirds was found. An extension splint was applied. *X*-ray examination showed rarefaction of the bone on either side of the line of fracture and fusiform enlargement at this point with thinning of the cortex. The upper fragment was displaced mesially and there was overriding of about one cm. Union did not take place, and a diagnosis of bone cyst was made by the roentgenologist.

The patient was transferred at her request to the Private Pavilion of the Mount Sinai Hospital. It was my opinion that she had an intramedullary neoplasm probably sarcomatous. Operation, October 30, 1925: four inch incision along the cleavage line between the deltoid and pectoralis major, the median cephalic vein being retracted. There was slight productive periostitis and some old blood beneath the periosteum. There was soft callus between the two fragments the upper one being mesial, the lower being lateral and pulled upward. After incising the periosteum and freeing it about both ends, the latter were delivered into the wound. The cortex was exceedingly thin and the medulla was occupied by a dry, white, somewhat glistening tissue resembling young cartilage. With a curette this material was scooped out from both ends of the bone until apparently normal marrow was reached. The process extended about two inches below and one and a half inches above the site of fracture. There was practically no bleeding, and no limiting membrane was observed. The upper fragment was then shaped so that it could be wedged into the lower. Repair of periosteum and muscles. Skin sutured with silk.

The arm was then put in abduction in a plaster of Paris spica.

On December 19th, the upper half of the cast was split and removed, but union did not seem complete. The wound healed per primam.

On January 6, 1926, the cast was removed,

and union seemed firm. Passive motion and massage were instituted. Subsequently diathermia was used. Recently she received two low voltage *x*-ray treatments but Dr. Bendick feared that callus production might be retarded and discontinued this therapy.

The pathological report by Dr. Mandlebaum was osteochondroma. There were no histological evidences of malignancy, but in this type of new growth microscopic criteria are somewhat unreliable as to the ultimate outcome.

While the control roentgenograms show the bone fragments in the position in which they were placed at operation there is little evidence of bone production or bony union. Moreover, examination of the upper arm which in January and February seemed solid and stable has more recently given the impression of slight false motion at the site of the fracture. Naturally one does not care to submit the parts to a vigorous test as yet.

*Discussion*

Dr. Walter M. Brickner: I am not a pathologist but I would feel very skeptical of the diagnosis of osteochondroma of the medulla of the shaft of the bone causing pathological fracture. We all know how easily one can be deceived by the microscopic picture. It seems to me that one would be justified in resecting the fractured ends of the bone and introducing a medullary bone graft; I believe that would not only be a more thorough treatment of the neoplasm than mere curettage, but that it would also give a better prospect of osteogenesis and union.

Dr. Frederic W. Bancroft: Dr. Aschner has asked me to tell if there is union in his case of osteochondroma of the humerus. I am inclined to think that there is union but it is very difficult to tell in cases where there is slight motion whether there is union or not. If one takes a normal arm there is always a certain amount of muscle give. To properly tell if there is non-union one must be able to fix one end of the bone and the fracture zone and then test the distal portion.

Dr. Aschner (closing): I believe this growth arose in the cancellous tissue. These central cartilaginous tumors although showing no histologic evidence of being malignant may eventually prove to be such. Thus Le Conte et al. (*Archives Surg.*, 1925, xi, 93) reported an enchondroma of the femur with repeated recurrences and ultimate death. This growth, however, was a more cellular one and finally proved sarcomatous.

At the time of operation I was not inclined to do a limited resection, because the nature of the growth was not determined. If it were sarcomatous amputation would have been indicated, and the prognosis even then is very poor. I shall be glad to show this patient again and will have frequent roentgenographic examinations made to watch the course of the disease.

## UNUSUALLY LARGE FIBRO-ANGIO-SARCOMA OF THE SCALP EXCISED BY THE ENDOTHERM KNIFE

GEORGE A. WYETH, M.D.

Female, aged five. At birth the child showed nothing abnormal except a black mark on the posterior half of the scalp, the size of a twenty-five cent piece. At the time of the operation the growth was five inches in diameter with metastatically involved glands of the neck. The growth was excised by the endotherm knife (which seals the lymphatics as it cuts) with but little hemorrhage and no surgical shock. The glands of the neck were treated by undermining the skin and coagulating by bipolar endothermy and were left in situ to be absorbed.

## MELANOMA OF THE SCALP EXCISED BY THE ENDOTHERM KNIFE

GEORGE A. WYETH, M.D.

Female, aged 25, cerebelliform melanoma of scalp, grade 3. Lesion approximately 7 × 3 cm. The patient reported that the lesion was growing, and its immediate removal was advised. The cutting current of the endotherm was employed and within a few minutes, under local anesthesia, the entire growth was excised without hemorrhage by the endotherm knife. No recurrence or evidence of metastasis in over two years.

## ACTIVE PIGMENTED NEVUS OF THE FACE TREATED BY MONOPOLAR ENDOTHERMY

GEORGE A. WYETH, M.D.

The history shows eight years slow growth of the lesion, with a very much accelerated rate

of growth within the preceding month and an increase of sensitiveness. The clinical diagnosis was melanoma but no slide was made because the black proliferations on an old pigmented nevus indicated a situation serious enough to make us wish to destroy the whole immediately without exposing the patient to the danger of mechanical dissemination by taking any tissue for microscopic examination. On March 10, 1925 the patient was operated on and complete anesthesia was employed in order to avoid the traumatism of the novocaine needle near the growth. The lesion was removed by monopolar endothermy (which destroys before removal) in a single treatment. The wound healed kindly without cicatrization and there has been no sign of dissemination or recurrence to date (over a year).

THE AMERICAN JOURNAL OF SURGERY

# EDITORIALS

## OS CALCIS FRACTURES

As practitioners of industrial and traumatic surgery and the records of accident insurance companies can testify, fracture of the heel bone is a peculiarly disabling injury. In most cases it results in a decided impairment of locomotion and, at best, it entails a long period of disability. In Frederic Cotton's classic study (*Annals of Surgery*, 1916, lxiv, 480; Dislocations and Joint Fractures, W. B. Saunders Co., 1924, p. 676) he included an observation of end-results in fifty-five cases, which showed that most of them had limping, pain or worse permanent disability; and he concluded that "results without more treatment than the traditional plaster are appallingly bad."

Os calcis fracture most commonly occurs from a fall upon the sole of the foot and, as Cotton has shown, in the overwhelming majority of cases there is a "more or less formless comminution of the bone as a whole." To merely immobilize in a plaster cast until union occurs takes no account of this distortion of structure and, consequently, it usually leaves the patient a cripple.

An injury so threatening in its portent of permanent disability deserves the most meticulous efforts to restore bony form and to secure early and complete return of joint function. The fracture commonly extends into the subastragaloid joint and, as Cotton has pointed out, in this way or/and by widening of the bone it causes immediate (and, unless carefully treated, also permanent) impairment of lateral motion of the foot. Subastragaloid arthrodesis is sometimes necessary to overcome the bad results of this fracture. It must be borne in mind, too, that the comminution often destroys the normal arch of the inferior surface of the os calcis and thus produces a traumatic flat-foot.

When it occurs with other injuries heel bone fracture is not seldom overlooked. Usually it can be recognized by swelling and ecchymosis about the heel, bone tenderness, and limitation of lateral motion of the foot (pronation and supination). A diagnostic sign described by Cotton is bony thickening below the external malleolus due to splitting off of the outer plate of the calcis.

For reducing and molding the fragments Cotton (and his coworker, Wilson) evolved certain definite procedures. These, performed under narcosis, consist, as may be needed, of the following manipulations: (1) Loosening the entangled or impacted fragments. (2) Pulling the heel down with the hands, or by traction with a steel sound passed through an incision in front of the tendo achillis, or, best, with fracture tongs. (3) Vigorous pronation and supination to free the subastragaloid joint. (4) Narrowing the widened bone by hammering and impacting the separated outer plate, with blows of a mallet through a pad of felt, the inner side of the foot being supported on a sand-bag. (5) Application of a plaster cast with the foot somewhat extended to relax the heel cord.

Curiously, in one of our leading surgical journals a few months ago, a surgeon solemnly described and illustrated these procedures without any mention whatever of their originator.

Weight-bearing on the broken bone is, of course, not to be considered until union is established, and must be interdicted even then since it tends to stimulate overproduction of bone. In his text-book Cotton states that it should not be allowed for "at least a month;" but in conversation

he has said that it should be avoided, if possible, for four months. To combine the advantages of early ambulation on both extremities with some simple means of taking the body-weight from the injured bone without immobilizing the knee, we have been employing for the past two years a procedure that we described in *International Clinics*, June, 1926:

After reducing the fracture a shaped pad of felt is placed under the sole of the foot to maintain the arch and then a plaster cast is applied from the heads of the metatarsals up to the expansions of the condyles of the tibia. Incorporated in the cast is a long U-shaped iron rod, of which the uprights extend close to the top of the cast, and the cross-bar projects below it. Upon this cross-bar the patient walks. Most of the body-weight is thus borne upon the head of the tibia and very little, if any, of the impact, is transmitted through the broken bone. At any rate, our patients have walked in this cast a few days after its application without pain. The method appears useful but, admittedly, it is quite secondary in importance to optimum reduction of displacements and preservation of joint function.

On about the tenth day (or immediately, if one prefers) the plaster cast is cut into two segments by dividing it in front of the bar and along the sides of the foot; and these segments are bandaged together. After the tenth day they are removed every day, for increasing periods, to permit active flexion and extension of the ankle and lateral motion of the foot. Passive motion, massage, baking are useful adjuvants in the after-treatment, but none of them, nor all of them together, are as valuable as *active* movements in obviating atrophy and joint stiffness in the management of fractures.—W. M. B.

## THE TREATMENT OF PULMONARY EDEMA. A SUBSTITUTE FOR PHLEBOTOMY

An interesting little group of letters in *The British Medical Journal* (June 19, 1926, pp. 1033–34) recalls that the condition known as "acute suffocative pulmonary edema" has never been satisfactorily explained. One gathers from these letters and case reports that the edema may be brought about by an increase of tension in the pulmonary vascular circulation, or that it may be accompanied by such hypertension, with or without demonstrable cardiac disease. The cases to which reference is made are not, however, of the type of gradual terminating edema with or without anasarca.

In the sudden suffocative filling of the lungs reported here by various writers, dry cupping has been employed with success (T. Gerald Garry) and external jugular phlebotomy is the therapy recommended by Ernest Bulmer. Yet in a report by E. V. Slaughter the patient was relieved after the use of digitalin, strychnine and atropine.

Now, since an attack of pulmonary edema at once brings us into the presence of a dire emergency when there may be no time to assign causes or even to make a complete examination, the physician must either play the part of mere spectator or he must "do something." The manometer or the trained finger on the pulse will quickly tell whether he is dealing with a final stage of failing general circulation. If the pulse is not feeble or flickering, or if the tension is not less than 80 systolic, the abstraction of blood from the veins is the treatment that comes logically to mind. But if there is to be recovery from the attack the temporary removal of blood from the vital organs within the thorax will suffice, and the reduction of blood volume by phlebotomy is unnecessary. The loss of fluid by bleeding is, in any event, quickly replaced by serum.

It has been shown that blood pressure as ordinarily measured with manometer and arm cuff can be reduced in less than ten minutes by from 40 to 60 points, using the old and well tried method of ligating the thighs close to the body with bandages or, better still, with rubber tubing. The

rubber hose of an enema bag is nearly always accessible. The ligature must be firm enough to obliterate the venous return while not obstructing the arterial supply to the limbs which, in a few moments, become swollen and blue with engorgement.

We have noted the rapid disappearance of pulmonary edema under this treatment which, by the way, was originally employed in hemoptysis. The late R. H. M. Dawbarn of New York was the first to practice this ligation as a prophylactic against hemorrhage during surgical operations and also to check bleeding from other causes; but he made no observations on the blood pressure while the ligatures were in position. This was first done by the writer in conjunction with Dr. A. J. Bendick of New York. The pressure gradually rises when the ligatures have been removed and may not return to its former reading for an hour. The ligatures should not be left on for more than twenty to thirty minutes and the one first applied should be the first to be removed.

The simplicity and effectiveness of this procedure, especially the rapid fall in blood pressure, can hardly be appreciated until it has been practically demonstrated.—Howard Lilienthal

# COMMENT AND CORRESPONDENCE

## THE IMPORTANCE OF SUTURE OF THE TRANSVERSUS FASCIA IN HERNIA OPERATIONS

In a rather lengthy editorial discussion of "The Rationale of Surgical Measures for the Cure of Oblique Inguinal Hernia" (the JOURNAL, March, 1926) we stated that "Bassini's hernioplasty is not, as many think, a reparative operation upon a disordered inguinal canal. It is not an attempt to restore the canal to an anatomic normal. It is an effort to alter the architecture of the canal. The chief plastic feature of Bassini's operation and of most of its modifications is the attachment by sutures of the so-called conjoined tendon (of obliquus internus and transversus) to Poupart's inguinal ligament, thus essaying to provide a muscle support for the peritoneum and abdominal contents across an area where *normally no such support exists!*" We also discussed the doubtful reliability of attachment, by suturing, of the rounded muscle edge of the so-called conjoined tendon to the inguinal ligament; and we called attention to the fact that suture of the cut edge of the external obliquus aponeurosis to the inguinal ligament provides no new support whatever (except insofar as it is used to narrow the superficial ring) since this aponeurosis is already attached to the ligament before it is incised to expose the canal. We again expressed our belief in the saccular (congenital) theory of hernia, so long and so ardently advocated by Hamilton Russell of Australia. We stated that in adults as well as in small children he courageously bases his operation for oblique inguinal hernia entirely upon this hypothesis and, eschewing all attempts at artificial support, he contents himself with tightly twisting, crushing and ligating *high* the neck of the sac. That the complete removal of any pouting of peritoneum is essential to a cure will probably be generally admitted. We also called attention, however, to the necessity for removing a *potential* pouting, an invitation to a fresh bulge of peritoneum, which exists in the opening in that essential support of the parietal peritoneum, the transversus fascia. This, as we reviewed, is recognized in the operations of Ferguson, Slattery, Pitzman, Harrison. We further expressed the opinion that if a repair of the stretched transversus fascia is satisfactorily accomplished after the sac is tied off high, no rearrangement of the architecture of the canal is necessary to effect a cure in oblique inguinal hernia; we said "we see in Russell's operation what we regard as a real fault, viz., that it takes no account of or, at any rate, makes no deliberate provision to repair, the defect in the transversus fascia through which the sac passes from the abdominal cavity."

Concerning this criticism Mr. Russell has written the following:

Cliveden Mansions,
East Melbourne, June 24, 1926.

Dear Dr. Brickner,

Many thanks for your kindness in sending me the reprint of your editorial. I quite appreciate your criticism about not taking any deliberate and formal steps to close the transversus fascia. What has been always in my mind (perhaps I ought to have stressed it) is that one of the virtues of the tight torsioning of the sac is that redundant peritoneum and transversus fascia are picked up in the twist, and are brought, both together, to the smallest point in the scar left after the healing of the crushed and ligated sac.

It seems to me that the fascia will become tightened up in this way, and less damage done to it, than will be the case if we undertake deliberate surgical manipulations with it. I don't know whether I have expressed it quite clearly or quite correctly; but I am satisfied that the practical application will be found satisfactory.

With kind regards,
Yours faithfully,
R. Hamilton Russell

To be sure, as we said, "in infants, in adults with narrow-necked hernia sac, the hiatus [in the transversus fascia] is small and it is probably sufficiently closed by the ligature applied to the sac;" and, obviously, the tight twisting of the sac, as performed by Russell, will especially reduce or adequately close off the stretched abdominal ring, in the manner that he states. We have observed, however, after executing this torsion even of a narrow sac that there remained a defect in the fascia that would admit the finger tip. Therefore we continue in the opinion that "when the ring is considerably stretched by the passage of a larger-mouthed sac it is altogether desirable that the opening in the transversus fascia should be reduced by sutures to only that size needed for the spermatic cord or the round ligament."

We believe that "deliberate and formal steps to close the transversus fascia" would add much to the reliability of Russell's operation. Theoretically, at least, this step and the torsioning and high ligation of the sac should effect a cure. It would be interesting to determine from a sufficiently large series of observations, whether such an operation, without plastic on the other canal structures, will not cure as many oblique inguinal hernias as operations including musculoaponeurotic reconstruction of the canal, and will not cure many more cases than will the musculoaponeurotic plastics undertaken without high ligation of the sac and closure of the defect in the abdominal ring.—W. M. B.

# PROGRESS IN SURGERY

*Selections from Recent Literature*

THE TREATMENT OF CUTANEOUS BURNS. Frederic W. Bancroft and Charles S. Rogers, New York. *Annals of Surgery*, July, 1926.

The authors conclude:

1. The use of tannic acid is a distinct advance in the treatment of cutaneous burns.

2. The systematic treatment of fluid depletion is of great value.

3. Patients with third degree burns often have late elevation of temperature and exhibit signs of infection. Life may be prolonged in these cases by removing the tanned membrane and treating infection.

4. Skin grafts should be applied soon after sloughs separate.

5. In children with circular burns of the extremities, caution should be exercised in attempting to correct deformities.

6. In deep burns of small surface area immediate débridement, associated with skin grafting, may be of value.

SODIUM CHLORIDE METABOLISM IN CUTANEOUS BURNS AND ITS POSSIBLE SIGNIFICANCE FOR A RATIONAL THERAPY. Edward C. Davidson, Detroit. *Archives of Surgery*, August, 1926.

In observations on the chloride metabolism of 31 burned patients, the lowering of the whole blood and plasma chlorides was significant. There was suggestive evidence that retention of sodium chloride took place. The observations suggest the administration of sodium chloride to correct the deficiency.

BURNS TREATED BY TANNIC ACID. Claude S. Beck and John H. Powers, Cleveland, *Annals of Surgery*, July, 1926.

The striking and most important features of the tannic acid treatment are: 1, the control of toxicity; 2, the simplicity of method; and 3, the comfort of the patient.

The degree of toxemia seems to be less marked in cases treated by tannic acid than in cases of similar severity treated by other methods.

Superficial burns treated by tannic acid show little or no toxemia. If the crust remains dry, the temperature, pulse and white cell count early become normal. If serum and pus collect beneath the crust, the temperature, pulse rate and white cell count become elevated, and when this occurs the crust should be removed. In deep burns some toxemia may develop. The coagulum of deep burns dries slowly and it seems that some absorption takes place as long as the crust is moist.

The partial prevention of toxemia seems to depend upon two factors. Precipitation of the protein and drying of the coagulum render the burned tissue innocuous, so that it is not absorbed. The almost waterproof covering afforded by the crust prevents loss of fluid and if large quantities of fluid are taken the blood does not become concentrated.

The care of the patient becomes a relatively simple matter. There are no traumatizing dressings and no weeping wounds. Coagulation of the burned area by spraying tannic acid on it is easily accomplished and subsequent exposure to air and warmth without dressings is tolerated well by the patient. In first degree burns the crust is displaced by the new epithelium as it grows beneath it. In deeper burns the crust can be removed by softening it with vaseline and cutting it away. After its removal the base can be prepared for skin grafting by compresses of saline or Dakin's solution.

Without exception the discomfort from the burn was decreased after the application of tannic acid.

The treatment of burns by tannic acid should be popularized. The solution can be made by the laity by mixing four teaspoonfuls of the dry powder in a glass of water. This will make approximately a two and one-half per cent solution. Tannic acid is easily procured and can be kept indefinitely as a powder. It should form an important adjunct to the equipment of first-aid stations of steel mills, mines, factories, etc., so that immediate application, by means of either compresses or the spray, can be carried out.

THE CAUSES OF CICATRICIAL CONTRACTION. J. Shelton Horsley, Richmond, Va. *Annals of Surgery*, August, 1926.

Cicatricial contraction is due to scar tissue, and covering the surface of a wound with epithelium alone does not prevent contraction

except so far as it prevents infection or unnecessary trauma to a raw surface.

The cicatricial contraction following *x*-ray or radium burns differs from other scars, in that the deeply penetrating rays cause an overgrowth of vascular endothelium which partially or completely obliterates the blood-vessels and makes a greater degree of ischemia.

There is a biologic resistance possessed by different tissues of the body to the normal secretions or excretions of their environment, so that in transplanting tissue this must be taken into consideration.

Certain regions of the body, possibly because of some inherent quality, or possibly because of mechanical conditions which retard complete extension, are more prone to scar tissue contraction than other regions.

As scar tissue is a lowly tissue that can survive on less nutrition and under harder conditions than other more highly differentiated tissues, it seems essential in avoiding cicatricial contraction not only to prevent the irritating effects of frequent injuries or of toxic substances, but to provide a blood supply so that the higher tissues may survive and not be overwhelmed by scar tissue.

The Treatment of Rodent Ulcers by Radiation. Raymond W. Lewis, New York. *Annals of Surgery*, August, 1926.

Radiation treatment of basal-cell epitheliomata is an excellent method because of its absence of operative procedure, its simplicity, excellent cosmetic results, and high percentage of permanent cures.

Statistically, there is little difference in the ultimate results between treatment by radium and that by surgical excision.

The treatment by radiation of those lesions where bone or cartilage is involved, or where the lesion is 4 cm. in diameter, or larger, is inadvisable. Treatment by radium should be undertaken in these conditions only when a surgeon, skilled in the treatment of cancer, finds that patient unsuitable for operation.

The patient's risk, in treating, through mistaken diagnosis, a squamous epithelioma, is probably little, if any, increased, if the rule be observed to refer promptly for surgical removal any lesion which increases in size after radiation, or any lesion which does not respond immediately and strikingly to one or two doses of radiation.

Free, Full-thickness Skin Grafts. Clarence A. McWilliams, New York. *Annals of Surgery*, August, 1926.

Autografts are always to be chosen since isografts are very uncertain.

Fresh, sterile operating wounds, and fine, granulating (sterile) areas are equally successful. Fresh fat and bone, bare of periosteum, are not usually areas to be grafted upon successfully with free, full-thickness grafts.

Where contractions should be avoided (as about eyes and joints), free, full-thickness grafts should always be used rather than Thiersch grafts.

Grafts must be free of fat, which should be removed by knife rather than by scissors, to avoid pinching the capillaries. No pinching of grafts with forceps is allowable. The grafts are to be cut of exactly the same size as the raw area to be grafted so as to preserve the normal tension of the skin to keep the capillaries open. Making perforations in the graft is not essential.

The grafts should be sewn in all about the edges accurately with close, interrupted stitches, so as to maintain the normal tension, thus keeping the capillaries open. Even, firm pressure of 30 mm. should be applied upon the grafts by means of an inflatable rubber ballon (Ferris Smith).

Absolute immobilization is essential for at least five days so as not to disturb the growing capillaries.

There is no limit to the size of the grafts that may be successfully transplanted.

Successful situations for full-thickness, free grafts: 1. When applied on fresh muscle and fascia, including pericranium and periosteum. 2. On bared sheaths of tendons, whether granulated or fresh. 3. On palmar fascia of hand. 4. On fine, clean, granulating areas generally, except the neck.

Unsuccessful situations: 1. On bone, bare of periosteum or pericranium. Bare skull bones are successfully grafted with Thiersch grafts. There are not sufficient capillaries on fresh, bare skull bones to nourish full-thickness grafts. 2. On fresh fat. This should be allowed to granulate first, if grafting with full-thickness grafts is contemplated. 3. The neck is not a successful position for full-thickness grafts because of the difficulty of complete immobilization. 4. The face is an admirable situation for full-thickness, free grafts. 5. Over joints

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Radiation treatment of basal-cell epitheliomata is an excellent method because of its absence of operative procedure, its simplicity, excellent cosmetic results, and high percentage of permanent cures.

Statistically, there is little difference in the ultimate results between treatment by radium and that by surgical excision.

The treatment by radiation of those lesions where bone or cartilage is involved, or where the lesion is 4 cm. in diameter, or larger, is inadvisable. Treatment by radium should be undertaken in these conditions only when a surgeon, skilled in the treatment of cancer, finds that patient unsuitable for operation.

The patient's risk, in treating, through mistaken diagnosis, a squamous epithelioma, is probably little, if any, increased, if the rule be observed to refer promptly for surgical removal any lesion which increases in size after radiation, or any lesion which does not respond immediately and strikingly to one or two doses of radiation.

Free, Full-thickness Skin Grafts. Clarence A. McWilliams, New York. *Annals of Surgery*, August, 1926.

Autografts are always to be chosen since isografts are very uncertain.

Fresh, sterile operating wounds, and fine, granulating (sterile) areas are equally successful. Fresh fat and bone, bare of periosteum, are not usually areas to be grafted upon successfully with free, full-thickness grafts.

Where contractions should be avoided (as about eyes and joints), free, full-thickness grafts should always be used rather than Thiersch grafts.

Grafts must be free of fat, which should be removed by knife rather than by scissors, to avoid pinching the capillaries. No pinching of grafts with forceps is allowable. The grafts are to be cut of exactly the same size as the raw area to be grafted so as to preserve the normal tension of the skin to keep the capillaries open. Making perforations in the graft is not essential.

The grafts should be sewn in all about the edges accurately with close, interrupted stitches, so as to maintain the normal tension, thus keeping the capillaries open. Even, firm pressure of 30 mm. should be applied upon the grafts by means of an inflatable rubber ballon (Ferris Smith).

Absolute immobilization is essential for at least five days so as not to disturb the growing capillaries.

There is no limit to the size of the grafts that may be successfully transplanted.

Successful situations for full-thickness, free grafts: 1. When applied on fresh muscle and fascia, including pericranium and periosteum. 2. On bared sheaths of tendons, whether granulated or fresh. 3. On palmar fascia of hand. 4. On fine, clean, granulating areas generally, except the neck.

Unsuccessful situations: 1. On bone, bare of periosteum or pericranium. Bare skull bones are successfully grafted with Thiersch grafts. There are not sufficient capillaries on fresh, bare skull bones to nourish full-thickness grafts. 2. On fresh fat. This should be allowed to granulate first, if grafting with full-thickness grafts is contemplated. 3. The neck is not a successful position for full-thickness grafts because of the difficulty of complete immobilization. 4. The face is an admirable situation for full-thickness, free grafts. 5. Over joints

Thiersch grafts should not be used because of their tendency to contract. Free, full-thickness grafts, or pedicled flaps, should be here employed.

Cystic Disease of the Testicle. (*Maladie kystique du testicule.*) A. Mirce, Craiova. *Le Monde Médical*, July 1, 1926.

The author describes a case of this very rare disease of the testicle. The patient presented himself with a large, smooth, elastic tumor which caused no pain. There was an antecedent history of an acute urethritis. The treatment consisted in ablation of the affected testicle. The tumor must be clinically differentiated from tuberculosis, and the various other benign and malignant neoplasms. Pathologically, this tumor appears to be classifiable under the group of the myxoid epitheliomata.

Hemophilia with Volkmann Syndrome: Report of Case. John Prentiss Lord, Omaha. *The Journal of the A. M. A.*, August 7, 1926.

The case reported has no counterpart in the literature. Lord believes that it gives indubitable evidence that ischemic myositis and neuritis (Volkmann paralysis) can be produced by impairment of the circulation when neither splints nor tight dressings have been used. [See editorial, the Journal, June, 1924, p. 160.]

Exophthalmic Goiter in Childhood. Henry F. Helmholz, Rochester, Minn. *The Journal of the A. M. A.*, July 17, 1926.

Thirty cases of exophthalmic goiter were observed in children less than 15 years old during the period from January, 1921, to March, 1926. Compound solution of iodine, administered in doses of from 5 to 10 minims (0.3 to 0.6 cc.) three times a day, reduced the basal metabolic rates and toxic symptoms very markedly. It made preliminary operations unnecessary in the last eleven cases. Of twenty-four patients operated on, two died, one in crisis twenty-four hours after operation and the other from bronchopneumonia one week after operation.

Retroperitoneal Cysts. With Reports of Two Cases. R. Leslie Stewart. *Edinburgh Medical Journal*, July, 1926.

True cysts occupying the retroperitoneal tissues are comparatively rare. The etiological factors concerned in their growth are uncertain, but the available evidence points to the majority of them being developmental in origin. The contributions of various observers indicate that the developing urogenital system is the commonest source. Recent research has suggested the possibility of some cysts arising from certain anomalies in the fusion of the layers of the fetal mesocolon with the parietal peritoneum.

Two clinical cases are recorded. In both, the cyst lay posterolateral to the cecum and ascending colon and, by forward compression of the ureter, caused hydroureter and hydronephrosis above. One cyst showed the typical structure of an ovarian cystadenoma in a portion of its wall, while the other revealed no characteristic features and only an atrophic epithelial lining. It appears justifiable to infer that both these cysts were probably of urogenital origin.

Clinical diagnosis is difficult, but considerable help may be expected from applied methods of roentgenography. Treatment by enucleation can be usually accomplished without difficulty.

Strangulated Inguinal Hernia in Infants. Frederick S. Wetherell, Syracuse, N. Y. *New York State Journal of Medicine*, July 15, 1926.

Strangulation in infants and children is observed most commonly during the first year.

The prognosis of radical operation is excellent, the average death rate being 0.5 per cent or less.

Taxis does not effect an enduring cure, and is a dangerous procedure.

The only contraindications to operation are the presence of intercurrent disease and a weak, ill-nourished infant.

Some consider operation on the very young infant preferable to operation during the second year, as it interferes less with the general development.

Studies of Calcium and Phosphorus Metabolism in the Fracture of Bones. Isidor S. Ravdin and Leon Jonas. Philadelphia. *Annals of Surgery*, July, 1926.

The mere addition of these substances to the normal diet is probably useless.

In certain cases deficient retention and fixation of calcium and phosphorus may result in non-union, but this cannot be recognized from blood serum estimations.

Ununited Fractures with Special Reference to the Chemistry of the Blood. Melvin S. Henderson, Thomas F. Noble and Kathleen Sandiford, Rochester, Minn. *The Journal of Bone and Joint Surgery*, July, 1926.

The failure of a fracture to unite is difficult to explain. That it may in certain instances be due to constitutional causes is hardly to be doubted. Investigation to determine this factor is to be commended and constitutional methods of treatment should be used as a routine in addition to surgical methods. Study of the calcium and phosphorus content of the blood, if carried out from the investigative standpoint, may prove of value in the future although in routine work it rarely leads to information of clinical value. Successful treatment of the average run of ununited fractures is in the great majority of cases a surgical problem and depends much more frequently on correct surgical technique than on methods directed toward overcoming the as yet unknown constitutional or chemical factors concerned in ossification.

Osteochondritis, or Epiphysitis. Arthur C. Christie, Washington, D. C. *The Journal of the A. M. A.*, July 31, 1926.

The anatomy of the epiphyses is reviewed, and the various conditions that may be classed under the heading epiphysitis or osteochondritis are discussed. These are: osteochondritis deformans juvenilis coxae; Osgood-Schlatter's disease; Köhler's disease of the tarsal scaphoid and of the second metatarsus; vertebral epiphysitis, an example of which is cited; epiphysitis of the os calcis and osteochondritis dissecans of König. Pathologic processes analogous to those mentioned have been reported in the developing olecranon, in the epiphyses of the ilium, in the semilunar bone, and elsewhere. It seems probable that no epiphysis in the body is immune to the disease. It is the general opinion that all of these conditions which pass under various names are the same pathologic entity modified only by the particular location in which they occur.

Freiberg's Infraction of the Metatarsal Head (Köhler's Metatarsophalangeal Syndrome; Juvenile Deforming Metatarsophalangeal Osteochondritis). Keith T. Meyer, Evansville, Ind. *The American Journal of Roentgenology and Radium Therapy*, July, 1926.

The etiology of the condition is unknown. It occurs much more frequently in the female. The second metatarsal is involved in nearly all the reported cases; occasionally the third; and rarely are both bones involved. In nearly two-thirds of the cases it occurred between the ages of ten and eighteen years.

The diagnosis is made from the roentgenogram which reveals the following: (1) broadening of the metatarsophalangeal joint space; (2) flattening of the neck and distal portion of the shaft, with the resultant disappearance of the constriction at the site of the neck; (3) bone absorption in the head suggestive of sequestration. In addition to these changes, the articular surface of the proximal phalanx may lose its circular form and become irregular.

Congenital Dislocation of the Hip. A Report of Three Hundred and Ten Cases Treated at New York Orthopedic Dispensary and Hospital. Benjamin P. Farrell, Herman L. Von Lackum and Alan De F. Smith, New York. *The Journal of Bone and Joint Surgery*, July, 1926.

If any large series of cases of congenital dislocation of the hip as now seen, success by closed reduction can be expected in only about fifty per cent. These results could be improved upon if more of the cases were treated early, and every effort should be made to bring this about.

The other factors chiefly responsible for the failures are such that they cannot be overcome by any method of closed reduction. In many cases the presence of these factors can be suspected but can be determined definitely only by open operation.

A Preliminary Report of Twenty Cases of Hip Joint Tuberculosis Treated by an Operation Devised to Eliminate Motion by Fusing the Joint. Russell A. Hibbs, New York. *The Journal of Bone and Joint Surgery*, July, 1926.

An attempt has been made by the operation described to produce a fusion of the hip joint

by an extra-articular method, similar to that used in the treatment of tuberculosis of the vertebral articulations.

This has been done in twenty cases by transposing the trochanter so that it makes contact with the ilium above and with the femur below and at the same time secures continuity of periosteum. The technic is described.

A Bone Graft for Sacro-Iliac Fixation. P. Jenner Verrall, London. *The Journal of Bone and Joint Surgery*, July, 1926.

The operation for fixation by a countersunk block, or by a sliding graft from the ilium, though frequently effective is prolonged and elaborate.

As in an old house, where the weight of the roof is tending to force the walls outwards, an iron tie rod with cruciform nuts at each end is often inserted; so it appeared that the sacro-iliac joints might be supported by a similar method, employing a tibial bone-graft.

The position of the patient and the general technique are the same as for an Albee spinal graft. A semilunar incision is made, convex upwards, commencing two inches below and external to one posterior superior iliac spine, and passing thence upwards and across the middle line to the corresponding point on the opposite side, thus enabling a skin flap to be turned down exposing both processes and the intervening parts covered with the lumbar fascia. With knife and periosteal elevator both posterior superior iliac spines are cleared from muscle externally and internally. A vertical incision, three inches in length, is now made over the sacral spines, in the midline between these two points. The sacral spines are cleared with an elevator and it will then be found that the second sacral spine lies directly in a line between the two posterior superior spines. This spine is removed. The bone is very thin and the spinal canal may be opened, but this is not a serious accident.

With a large gimlet-drill, followed by a narrow gouge, a tunnel is cut through the two exposed iliac spines from without inwards, sufficient in caliber to hold a tibial graft three-eighths to one-half inch wide. The bone is quite cancellous and no force is needed in boring.

Next, with a large blunt periosteal elevator the erector spinae muscle masses are raised from the sacrum along the line of the proposed graft.

With a long probe measurement is taken of the length of graft required to pass through one tunnel, under the muscle, across the raw surface left by the removal of the sacral spine and on to the other side. A three-eighths to one-half inch wide graft of the requisite length is cut from the tibia in the usual way, and this is driven in from one side with light blows of the hammer until it emerges through the opposite tunnel, the medullary side of the graft facing downwards so as to be on the raw area on the sacrum. No fixation is required, the fascia is closed with catgut and the skin closed.

The advantages of this method are:

1. That the tie beam is the true sacro-ilac support.
2. The operation is easy and no extra fixation is required.
3. It is extra-articular, and there is at least good hope of avoiding an abscess in tuberculous cases.
4. Results have been good in the limited number of cases as yet treated by this method.

The X-Ray Treatment of Hypofunction of the Ovary. With Special Reference to the Regulation of Menstrual Function. I. Seth Hirsch, New York. *Radiology*, August, 1926.

A certain dosage of radiation in carefully selected cases is capable of producing improvement in ovarian function, as shown by the regulation of menstruation and the induction of pregnancy, with the birth of healthy children.

There cannot be any objection to this form of treatment on grounds that the already diminished ovarian activity can still further be diminished by the small doses of radiation. If the condition of the ovary is such that this should actually take place, nothing is lost, for such an ovary is hopelessly incompetent to produce the menstrual mechanism, or to produce an ovum capable of fecundation.

Sterility Associated with Habitual Amenorrhea Relieved by *X*-Ray Therapy. I. C. Rubin, New York. *American Journal of Obstetrics and Gynecology*, July, 1926.

Rubin concludes:

1. Habitual amenorrhea is associated with sterility in about *5* per cent of cases.
2. Pregnancy takes place in about *5.5* per cent of the untreated cases.

3. In nine out of twelve cases treated with mild doses of *x*-ray, pregnancy resulted (i.e., 75 per cent of the treated cases). Only one of these patients aborted. The rest carried to full term and gave birth to normal children. Among seven of the latter personally delivered there were six males and one female.

4. *X*-radiation of the ovaries resulted in restoration of the menses in eleven out of twelve cases of amenorrhea.

5. *X*-radiation of the hypophysis area and the thyroid appears to have an adjuvant value. Two of the pregnant cases and two of the nonpregnant cases received hypophyseal irradiation. One of the pregnant cases also received thyroid irradiation.

6. Peruterine tubal insufflation and endocrine therapy are aids to the therapeutic action of the *X*-rays in cases of amenorrhea associated with sterility.

7. As the ovaries were found to be definitely enlarged before treatment in eight of the nine successful cases treated with *x*-rays, careful examination with regard to this point may aid in selecting the cases of amenorrhea associated with sterility suitable for ovarian stimulation. When no ovarian enlargement is found, irradiation of the hypophyseal area or the thyroid, etc., may be more advisable and should certainly precede irradiation of the ovaries.

Present Status of the Toxemias of Pregnancy. John Osborn Polak, Brooklyn, N. Y.

The treatment of the pre-eclamptic state and of eclampsia is essentially medical. The obstetric problem comes in for consideration only when labor is established by the convulsive seizures. Notwithstanding the fact that convulsions cease in 52 per cent of the cases when the uterus is empty, the results in any extensive series of clinical observations do not justify making delivery the first consideration in view of the poor surgical risk. Naturally, the treatment of the latter month toxemias revolves itself into (1) prevention; (2) control of the convulsion and (3) management of labor in the presence of convulsions when labor has started. Polak's plan has been to disregard the labor until complete dilatation of the cervix is obtained when, if the head is engaged and at the spines, delivery may be expedited by the use of low forceps under light oxygen-ether narcosis added to the morphine analgesia. Cesarean section has been limited to those cases in which there was a definite obstetric indication and not employed as a routine for rapid delivery.

Eclampsia at the Chicago Lying-In Hospital: Immediate and Late Results. J. P. Greenhill, Chicago. *The Journal of the A. M. A.*, July 24, 1926.

As a result of this study, Greenhill feels that the treatment of antepartum and intrapartum eclampsia should not be entirely conservative nor entirely radical. In experienced hands he favors emptying the uterus in most cases, and the method selected depends on the condition of the patient, the size of the baby and the state of the cervix. Where the patient is a primipara with a viable baby and the cervix is undilated, he prefers to terminate pregnancy by a low or cervical cesarean section *under local anesthesia* as soon after the first convulsion as possible. He believes that all patients with eclampsia should be sent to a hospital. When a patient must remain at home the treatment should be conservative. It should also be conservative in a hospital when the attending physician is not skilled in operative obstetrics.

The Intravenous Magnesium Sulphate Treatment of Eclampsia. A Collective Report of 142 Cases. E. M. Laxard, John C. Irwin and John Vruwink, Los Angles. *American Journal of Obstetrics and Gynecology*, July, 1926.

The following is routine at the Los Angeles General Hospital: Preeclamptic cases with blood pressure 150 or higher, in addition to the usual sedative and eliminative treatment and dietary regulation, receive 20 c.c. 10 per cent solution magnesium sulphate intravenously; blood pressure to be taken twice daily and intravenous magnesium sulphate injection repeated if blood pressure does not come down. Surgical interruption of the pregnancy only with the consent of senior attending obstetrician. In eclampsia, 20 c.c. 10 per cent solution magnesium sulphate intravenously as soon after first convulsion as possible, to be repeated every hour until convulsions are controlled (attending obstetrician to be notified if convulsions are not controlled within three hours). Blood pressure to be taken every hour after the convulsions are controlled and if blood pressure begins to rise, again nearing its height at time of convulsion, repeat magnesium sulphate; also repeat if convulsions recur.

The authors conclude:

1. Intravenous administration of magnesium sulphate in sufficient dosage will prevent the development of convulsions and will control them after their onset.

2. A series of eclamptics is presented which, under the intravenous magnesium sulphate treatment, shows a corrected mortality of 9 per cent.

3. The true nephritic type shows the greatest mortality.

4. Surgical interference in the eclamptic should be limited to assisting labor (in the second stage) on definite obstetric indications.

5. Cesarean section in the eclamptic is contraindicated except in the presence of absolute obstetric indications.

Low or Cervical Cesarean Section. Minford Armour Hanna, Kansas City, Mo. *Southern Medical Journal*, July, 1926.

Low or cervical cesarean section reduces the danger of rupture of the uterus in subsequent labors. If it should occur, the rupture will be located where there is little liability to serious complications.

The operation lowers maternal morbidity and mortality. It prevents a spill of meconium and liquor amnii that would soil the peritoneal cavity.

Low cesarean section provides the opportunity to give the parturient a real test of labor before concluding that abdominal delivery is necessary.

There are less shock and bleeding, and fewer chances for postoperative sequelae in cervical section. It provides a safe method for delivery in cases where the classical operation often would be followed by peritonitis.

There are no raw surfaces or suture lines left that could be the site of adhesions. In low cesarean section the denuded surface of the lower flap is in direct contract with the peritoneal surfaces of the upper flap. This insures union within a few hours.

The development of local anesthesia makes it well within the province of surgery to deliver by low or cervical cesarean section, with comparative comfort and safety, those cases suffering from heart, lung or kidney disease.

It is no longer accepted as modern technique to make an incision from the ensiform cartilage to the symphysis pubis and deliver the uterus on the abdomen before delivering the baby. With the judicious use of pituitrin, it is not necessary to grasp the broad ligaments in order to control hemorrhage and the danger of shock which is associated with the delivery of so large a viscus as an impregnated uterus, and the attendant possibilities of infection, make this procedure frowned upon by men versed in careful surgical technic.

Nichols, B. H. Cleveland. Interpretation of the Pyelographic Shadow. *Radiology*, St. Paul, June, 1926.

Nichols believes that the diagnosis of a pathological condition in the kidneys is most often established by means of a pyelogram.

The advisability of surgical interference and the type of operation to be performed are usually decided in accordance with the pyelographic findings.

The radiologist should have a thorough knowledge of all anomalies which may be present in the kidney in order to make a clear diagnosis of any pathologic condition.

Errors in the interpretation of pyelograms are due to failure to recognize anomalies, and to incomplete filling of the kidney pelvis.

The important anomalies may range as follows: (1) From the small embryonic type of kidney pelvis to the large pelvis with numerous calyces; (2) from the elongated cephalic calyx to the bifurcation of the pelvis and ureter as far as the bladder; (3) from the slightly rotated pelvis to the almost inverted pelvis in the horseshoe kidney; (4) the innumerable bizarre formations of congenitally abnormal pelves and of the pelves of misplaced kidneys.

The embryonic pelvis may be found in a congenital atrophy of the kidney. This type of pelvis may be confused with the contracted pelvis of pyelitis.

The dumbbell shape of the cephalic calyx is an important lead in the interpretation of a bifurcation of the ureter when only the upper calyx is filled; this condition should be differentiated from a tumor of the lower pole.

A ureterogram should be made if bifurcation of the ureter is suspected.

The misplaced kidney should be differentiated from the floating kidney by films made in both the upright and the horizontal positions.

The rotated kidney may easily be recognized; the inverted type of pelvis with the calyx drooping downward is characteristic of the horseshoe kidney.

Hydronephrosis in an early stage is to be suspected when the minor calyces are

obliterated and the calyces and pelvis are dilated.

Hydronephrosis is caused by renal calculi, ureteral calculi, ureteral stricture, tumor of the ureter, enlarged prostate, a congenital valve in the posterior urethra of a male child, an abnormal renal artery, a movable kidney with kink or torsion of the ureter, pregnancy, a tumor with compression on the ureter, or a tabetic bladder.

Localized hydronephrosis is caused by tumor, calculi in a calyx, or a stricture of the infundibulum.

The degree of hydronephrosis is no criterion of the severity of the obstruction.

The pyelogram does not disclose an empyemic kidney.

Pyelonephrosis is not evident on the pyelogram unless a perinephritic abscess has formed and has ruptured into the pelvis or ureter.

Clubbing of the calyces and moderate dilatation are early evidences of chronic *pyelitis*. Later, contraction may take place, producing a small distorted pelvis.

Pyonephrosis is evidenced by a dilated pelvis and calyces, by areas of necrosis shown by abscess cavities, by areas of connective tissue repair in the kidney, and by enlargement of the kidney.

Tuberculosis of the kidney is a pyonephrosis and may show a characteristic irregular pyelographic outline with an ostrich-plume appearance.

Phosphatic stones in the kidney pelvis usually assume the shape and size of the pelvis; if they are spherical they may simulate tumor.

Adenocarcinoma and hypernephroma usually originate in the pole of the kidney and encroach on calyces, or they may involve the pelvis and produce long spindle-shaped calyces with clubbed ends.

Embryoma, the so-called sarcoma of children, is seldom pyelographed.

Papilloma deforms the pelvis and may be accompanied by stone and hydronephrosis due to transplants in the ureter.

Polycystic kidney is usually not pyelographed, but when this is done, characteristic cystic areas encroaching on the pelvis are seen.

A solitary cyst, if large, encroaches on the terminal calyces.

# BOOK REVIEWS

Roentgen Interpretation. A Manual for Students and Practitioners. By George W. Holmes, M.D., Roentgenologist to the Massachusetts General Hospital and Assistant Professor of Roentgenology, Harvard Medical School; and Howard E. Ruggles, M.D., Roentgenologist to the University of California Hospital and Clinical Professor of Roentgenology, University of California Medical School. Third Edition. 8 vo. Pp. 326; 226 illustrations. Price $5.00. Philadelphia and New York: Lea & Febiger, 1926.

In our review of the second edition of this manual (the Journal, June, 1921) we called attention to its excellence and also, at some length, criticised its shortcomings. These lay in omissions of important matter, in descriptions too sketchy and condensed. In this third edition these shortcomings are to some extent corrected, by expansion of the work to include 50 new illustrations and 100 additional pages. Thus, in the section on bone affections malignant tumors are discussed more adequately and under recent terminology. This section, however, still leaves much to be desired. The consideration of bone abscesses and of typhoid infection of the bones, to mention only some of the topics—is altogether inadequate and unillustrated. The same may be said of the discussion of bursae, and there is neither roentgenogram nor mention of the familiar lime deposit that so often occurs in or upon the supraspinatus tendon in subdeltoid bursitis. Improved though the section on bone affections is, it is weak in what the student would naturally turn to such a book to learn, viz., differential diagnosis. A manual of roentgen interpretation that dismisses the entire large subject of syphilis of the bones with about six hundred words and that of joint syphilis with less than one hundred, falls short of what might be expected of it. We appreciate that the authors' purpose has been to "present a brief survey of the field of roentgen-ray diagnosis." Within that purpose and as far as it goes, it is excellent; but it does not go far enough. Roentgen interpretation implies, of course, differentiation. As in other departments of roentgen diagnosis pitfalls lurk in that of bone and joint affections; and we can but regret that so excellent a manual as this one is in most other respects, should again fail to measure up to its possibilities in this important subject. The bibliographic references are also inadequate; many of the most important ones are omitted.

Plastic Surgery of the Nose. By J. Eastman Sheehan, M.D., F.A.C.S.; Associate Surgeon and Lecturer to the International Clinic of Otorhinolaryngology and Facio-Maxillary Surgery, Paris; Plastic Surgeon and Chief of Nose and Throat Clinic, New York Post-Graduate Medical School and Hospital; Member, Royal Society of Medicine, London; Member, American Association of Plastic and Oral Surgeons, etc. 4to. Pp. 249; 177 figures and 9 plates. Price $10.00. New York: Paul B. Hoeber, Inc., 1925.

In this attractive volume Sheehan describes what he considers the operations of choice for all the various deformities of the nose—a field of plastic surgery to which he has made some original contributions. He uses, and adequately defends, the columella incision in preference to entry through incision in the mucous membrane of the naris—which, however, he recognizes as necessary in a few of the plastic operations. The operations are illustrated by line drawings and are briefly described. The author does not discuss the technics of the operations in any detail, however, and the book rather tells how, in general, they are done than just how to do them. There are 72 photographs of patients showing nasal deformities before operation. While there is no photograph showing the result of operation, the author states in his preface that these are available for inspection on application.

The Peaks of Medical History. An Outline of the Evolution of Medicine for the Use of Medical Students and Practitioners. By Charles L. Dana, A.M., M.D., LL.D., Professor of Nervous Diseases, Cornell University Medical College; Late President of the New York Academy of Medicine, etc. 8 vo. Pp. 105; 40 full page plates and 16 text illustrations. Price, $3.00. New York: Paul B. Hoeber, Inc., 1926.

In this day of "Outlines" of the history of every form of human activity one might feel assured that the important subject of medical history would not fail of the attention it

deserves. The late Sir William Osler's "Evolution of Medicine" was a noteworthy book in this direction. Dana's work is of a somewhat different and novel character. He has chosen seven epochs in the history of medicine to which he has applied the felicitous name "peaks," and having outlined them in a chart he proceeds to develop in the text the characteristics of each "peak," and of the valleys which lay between them. It is an original and somewhat startling method of great practical value. Dana points out that although the present status of the profession is the result of the work of only the last four hundred of the four thousand years of its existence, nevertheless there is much of interest in the labors and studies of the other three thousand six hundred years. The two great causes in the retardation of the development of medicine were the prejudice against dissection and the attempt to combine medicine with philosophy.

This book will form an excellent outline or guide for lecturers on medical history. It is remarkably agreeable reading in spite of its condensation into one hundred pages. The author has a dry wit which is most agreeably manifested in quaint turns on many occasions. Thus in writing of Arabic medicine he states that for six hundred years obstetrics and gynecology were entirely in the hands of women; "The corroding shackles usually put upon the enslaved sex were, for a long time, loosened and an opportunity given women to demonstrate their ability. But they gave no sign." "Charms, incantations and the weird vagaries of astrology were also infused into medicine, which was thus lifted from the weariness of dry detail and earthly processes to the serener atmosphere of the star, carrying too often the patients with it." Dana knows how to make what might be a dry record a charming narrative. The copious illustrations in the book were chosen with great care to illustrate the various phases of medical history and are, as Dana tried to make them "kinetic" instead of a lot of merely "static" portraits.

Francis R. Packard.

The Principles of Anatomic Illustration Before Vesalius. An Inquiry into the Rationale of Artistic Anatomy. By Fielding H. Garrison, A.B., M.D. 12 mo., Pp. 58; illustrated. Price $2.50. New York: Paul B. Hoeber, Inc. 1926.

This delightful little book is not so much a history of pre-Vesalian anatomic illustration as it is a treatise on the basic principles underlying all attempts to portray anatomic structure, from the earliest efforts of prehistoric man down to the time of the great anatomist who established and put in practice the principles upon which the art rests today. As the author points out, all anatomic illustrations that have remained to us prior to those of Vesalius may be divided into two groups. The first, showing servile adherence to tradition and corresponding faulty delineation, is to be found in manuscripts and drawings, based on the traditional Galenic anatomy of pigs, apes, etc., or such as are found in the "Five Picture Series," occurring with startling similarity in China, Japan, Persia and all throughout Western Europe and, as Garrison says, showing "a species of observation and delineation not much better than that of modern school children." In contrast with this, the second group consists of the wonderfully accurate and vivid presentations seen in the drawings, paintings and sculptures of many artists, including those of the prehistoric cave dwellers, and the later artists of the Renaissance, to the time of Leonardo da Vinci. Garrison illustrates his thesis by producing pictures of the so-called "Willendorf Venus," a statuette remaining from the Aurignacian period (40,000–16,000 B.C.), neolithic figures from Malta and some ancient Egyptian sculptures. These show with marvellous accuracy certain pathologic features which indicate acute observation and truthful reproduction. The artistic and correct representation of anatomic forms was continued by the great Italian artists, culminating in the great Leonardo. Garrison gives an outline of his anatomic work and a résumé of Streeter's interesting discovery of the manner in which the close union between the Italian painters and the doctors was brought about, the result of which was both to make anatomists of the painters, and to provoke more interest on the part of the doctors in a subject of such great importance to their art.

There is so much meat in this little volume with its copious, well-chosen and beautifully reproduced illustrations that only a careful study of its pages can render it justice. It brings into well-deserved prominence the importance of observation to the clinician by showing how even in prehistoric times an accurate observer could depict and realize the importance of physical defects, although

unable to label them, whereas the unobserving copyist who professed to teach anatomy or medicine merely propagated absurd errors and thereby hindered scientific progress.

Francis R. Packard.

Die Chirurgie. Eine zusammenfassende Harstellung der allgemeine und der speziellen Chirurgie. Herausgegeben von Prof. Dr. M. Kirschner, Königsberg und Prof. Dr. O. Nordmann, Berlin. Die Chirurgie des Magens und Zwölffingerdarms, Von Prof. Dr. N. Guleke, Prof. Dr. H. Nieden und Prof. Dr. H. Smidt, Jena. Lieferung 10, Band 5. 320 Seiten; 91 Abbildungen und 10 farbigen Tafeln. Berlin und Vienna: Urban und Schwarzenberg, 1926.

This addition to the system of surgery appearing serially is devoted to a consideration of the surgery of the stomach and duodenum. In its readability and in its compass of the subject, it maintains the high standard set by the previously issued parts. Numerous roentgenographic reproductions and beautiful black and white and colored illustrations accompany the text.

Ventrikulographie und Myelographie in der Diagnostik des Zentralnervensystems. Von O. Jüngling, a.o. Professor und Oberarzt der Chirurgischen Universitätsklinik, Tübingen; und H. Peiper, Privatdozent für Chirurgie und Assistent der chirurgischen Universitätsklinik, Frankfurt a.M 8 vo; 195 Seiten; 210 Abbildungen. Leipzig: Georg Thieme, 1926.

This is a very timely book, and contains much that is of interest to the neurologist and to the neurological surgeon. The first part of the monograph, by Jungling, deals with the value of air injections for the diagnosis of brain tumors and other intracranial conditions. While there is nothing very new in the article, it gives a very fair statement of the present knowledge and value of ventriculography. Jungling expresses surprise that so few men have made stereoscopic roentgenograms of the air-filled ventricles. He does not seem to know that in this country, at least, stereoscopic plates are made when air is injected into the ventricles for pneumography.

The second part of the book, by Peiper, is devoted mostly to the value of lipiodol (Sicard and Forestier) or of iodopin, which is used by the Germans. Peiper believes that the diagnosis of spinal tumors should never be made without an iodopin injection and roentgenogram—with which the reviewer entirely disagrees. Peiper thinks *x*-ray studies with lipiodol are of great value in fractures of the spine in order to determine whether or not there is a spinal block. The part devoted to spinal block from adhesions between pia and arachnoid is a very interesting one, and in many respects the best part of Peiper's contribution.

Operative Frakturenbehandlung. Technik-Indikationsstellung-Erfolge. Von Dr. Rudolf Demel, Assistent der I Chirurgischen Universitätsklinik in Wien. 8 vo; 227 Seiten; 212 Abbildungen. Wien: Julius Springer, 1926.

This little monograph consists essentially of a report of the open treatment of fractures at the clinic of von Eiselsberg. Of a series of 1412 cases of fracture seen during a period of 16 months only 77 came to open operation. These cases are reported in detail with numerous roentgenographic illustrations. Open operation is undertaken only when the closed treatment has proven unsuccessful or in certain special fractures. For the most part these indications are those commonly recognized. In their treatment, the clinic prefers the use of a rustproof steel wire prepared by the Krupp concern to plates of the Lane or Lambotte type. The volume is interestingly written and presents a very sane attitude on the whole question of the open or closed treatment of fractures. This may be summed up in brief in the statement that over 90 per cent of all fractures are amenable to closed reduction and that only in special cases is the open reduction to be undertaken.